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Bulletin

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PREVENTIVE MEDICINE AND THE FUTURE OF MEDICAL PRACTICE *

HENRY F. HELMHOLZ, M.D.

ROCHESTER, MINN.

In no sphere of medicine does prevention play so large a part as in pediatrics, and in no other branch of medicine has the growth of a specialty been so intimately associated with a corresponding development of preventive measures, emphasis being placed on the prevention of disease rather than on its cure. I doubt whether any specialized field has ever grown more rapidly than pediatrics in the last fifteen years, and this at a time when preventive measures, so-called public health work, were being carried on very much more actively and extensively than ever before. One might almost say that the demand for the pediatrician was created by the campaign of education in health matters of childhood. At that time, the greatest field of preventive medicine, the first year of life, was almost entirely neglected. The general practitioner was content to leave the care and feeding of the infant to the nurse, to the mother, or to the directions on the bottle or carton; he concerned himself with the infant only when it became ill. The high death rate among infants was considered a weeding out of the unfit, and only when national fervor stirred the profession did we begin to take an interest in the normal child.

Since 1892, when Budin first inaugurated his conferences for mothers, we have traveled far along the road to child health, and it can be said to our credit that a large part of the work has been done by pediatricians. Many of us have spent no small part of our time in developing prevention programs that, in the minds of some, represent almost treason to the medical profession. It is said that we are undermining the profession; that the physician will be out of a job, and that there will be no more sick to treat. Such statements have been so frequently made that it seems essential to analyze them more closely. We, as pediatricians, are even more concerned than is the general practitioner, because our work is in large measure already preventive medicine and is becoming more so each year. For example, in years gone by, during the summer months, the pediatrician was busy taking care of patients with cholera infantum or lesser gastro-intestinal disturbances; now it is the exception to see acute cholera infantum, even in hospital practice. The intelligent mother, at the first sign of trouble, cuts down on the baby's food, gives only water, and later probably telephones her physician to find out how soon she can increase the child's food.

Has this worked to the disadvantage of the pediatrician after all? Is he not taking care of practically all the babies of his clientele in a preventive way? His duties have changed from curing the sick infant to keeping his little charge well. The slogan of infant welfare organizations, "Keep the well baby well," illustrates admirably this change of work. The campaign of education has carried us much beyond this point, however. The average mother begins to ask that her baby be given cod liver oil, in order that it may not develop rachitis. She gives her baby orange juice at 3 or 4 months of age, even without a physician's order, because she knows that it will prevent scurvy. Scurvy has become so rare a disease in infancy that in some places it is difficult to find a case to demonstrate to students. With the widespread use of cod liver oil and sunshine, rachitis, too, can be practically eradicated. The very cornerstone of pediatric practice, infant feeding, is apparently doomed to a very considerable shrinkage, because by publicity, by collective and individual effort, we have convinced every mother that to nurse her baby is to take out health insurance. Moreover, artificial feeding has been so simplified and made so safe that not only are many disturbances prevented, but it becomes simply a matter of gradually increasing the amount of a single food mixture during the first half year of life, formerly an extremely difficult period to handle.

Vaccination against smallpox was in vogue so long before we started practicing that it has not occurred to us how it was cutting down our practice. Preventive inoculation with toxin-antitoxin mixtures against diphtheria will, I hope, eradicate diphtheria from our practice. Moreover, the recent work in scarlet fever by the Dicks makes it seem more hopeful that this disease, too, may be prevented. Measles can be prevented temporarily by the use of Degwitz convalescent serum. Typhoid has been almost eradicated from most of our communities by controlling the water and milk supplies. The prevention of tuberculosis is in large measure a pediatrician's duty. Tuberculosis, once supposed to be uniformly fatal in childhood, is now known to be fatal only to those who have received an overwhelming infection, or whose general resistance is greatly reduced. We know that most children who become infected show no clinical signs or symptoms of the infection, and only by a skin test is it discovered that they have passed successfully through a tuberculous infection and have immunized themselves against it. The campaign for the pasteurization of all milk consumed by infants and children has practically eradicated the bovine type of infection. The public health measures of hygiene and periodic examinations have

* From the Section on Pediatrics, Mayo Clinic.

* Chairman's address, read before the Section on Diseases of Children at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

done much to reduce the incidence of active tuberculosis. Shall we be able to prevent diseases such as rheumatic fever, endocarditis, chorea, and acute nephritis by the timely removal of tonsils and other foci of infection?

Public health work has given the public an entirely new idea of the possibilities of child health and has brought about a demand for care of the child such as we have never had. The parents bring the child to the physician, not because he is sick, but because they want to know what more they can do to make him well in mind and body.

As pediatricians, we have seen our duty in the preventive field of the first two years of life. We have been following our infants carefully through their first two years; we have prevented feeding disturbances, rickets and scurvy, and possibly some of us have seen to it that all the infants under our care have been vaccinated against smallpox and diphtheria. But what have we done after the second year? We have turned our wards loose, to return to us only when sickness arose.

In conversation with numerous pediatricians from all parts of the country, I have found scarcely any who have a definite schedule worked out for regular examinations after the second year, or a regular program of general hygienic measures. The period from 2 to 6 years is, in a measure, just as neglected a time for the child of well-to-do parents as it has been for the child of the poor. We dismiss the healthy child from our preventive care at the end of the second year, and he enters school at 6 years of age, with numerous remediable defects, infected tonsils, decayed teeth, flatfoot, poor posture, and behavior disturbances which in many instances might have been prevented or corrected before he entered school. Even in the school period, the average school examination is not thorough enough to locate any but the most glaring defects. Every child is entitled to a complete physical examination, including an analysis of blood and urine, twice during its third year and once each year thereafter. This schedule is something that we should impress on the parents at the first visit when we see their infants, so that they will conceive of prevention not as something that concerns only the infancy of their charge, but as a thing of importance to the end of childhood, or better, throughout life. If this prevention program is preached from the beginning, I do not believe that we shall have any more difficulty in carrying it out in its entirety than we have had in obtaining monthly supervision of infants during infancy. Parents should not have a feeling that they are unwarrantedly taking the busy doctor's time by bringing in a perfectly normal child for examination, but should be encouraged in this practice; if possible, a definite time should be set aside for examination of well children. Such an arrangement will not be difficult; in fact, it has been practically forced on us. Public health education has kept one step ahead of us, and we are only catching up, not leading the way.

The medical education of pediatricians in many schools has been, in a measure, incomplete, because of insufficient work in preventive pediatrics. I feel that a pediatrician without the preventive point of view is no pediatrician. The practice of pediatrics will become more and more a practice of preventive medicine. Our work with the sick, by our own effort, is being taken away from us. We aim to prevent disease which formerly we were called on to treat; thus our work has changed, but not disappeared. In the measure in which we interest ourselves in this campaign of prevention will the public appreciate and demand our services in prevention of disease, as it has formerly done in its cure.

Pediatrics is the only branch of medicine in which the physician takes special training to do general practice in an age period. As Dr. Veeder has put it, the pediatrician should be a physician of broad medical training, who is also able to supervise the growth and development of the child and observe its reaction to environment. The distinguishing feature of a pediatrician, then, is his knowledge of preventive medicine. Just as prevention of disease is becoming the major part of our work as pediatricians, preventive measures will grow to play an increasing part in the work of the general practitioner, and if the appreciation by the public of the service rendered by the pediatrician is any criterion, the general practice of medicine should undergo a similar development, provided the general practitioner will meet the demand of the public.

THE OVERWEIGHT CHILD*

BORDEN S. VEEDER, M.D.
ST. LOUIS

During the last decade the subject of the nutrition of older children has been one of the most important and fruitful phases of pediatric study. The question of normal standards of nutrition and the many sided problem of the cause, prevention and management of undernutrition have been attacked by numerous workers. In all this discussion, however, very little has been said of the other type of abnormal nutrition—the overweight child. This is the more surprising when one considers that obesity has been a subject not only of importance in internal medicine but also of widespread interest to the laity. My own interest has been attracted to the subject through watching the growth and development of a group of more than 200 boys in a private school of the country day type during the last four years, as in this school the overweight boy has been as much of a problem as the underweight. The general physical condition of the children in this school is not comparable with the condition of the general run of school children, as the pupils come from families in which care and attention have been paid to health and hygiene since infancy. The youngest boys are 9 years of age and the upper level is 17. As is well known, the percentage of undernourished school children diminishes as we approach the prepubescent years, whether or not specific efforts have been directed to nutrition. Our figures show only from 7 to 8 per cent. each year of boys underweight for their height, and these are limited almost entirely to the lower three classes. In checking up our work each year we have found in this particular school that the percentage of overweight boys is practically the same.

The first question that arises is obviously the one of "standards." While workers are in rather general agreement that children 10 per cent. or more under average weight for height, when measured by some table, as that of Baldwin and Wood, are underweight and undernourished, more critical study has shown that this is not an absolute test. In studying the overweight child, we have noted that body type or habitus plays an even greater rôle than with the underweight. The

* Read before the Section on Diseases of Children at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

only statement we can find in literature of the application of height-weight tables in reference to overweight is that of Emerson, who states that, when "the excess passes beyond 20 per cent., we may call the condition obese." This is not an absolute rule. While some children 20 per cent. over average weight for height are decidedly obese, we have encountered others who are particularly fine, muscularly developed specimens. In our school examinations, the boys are recorded under the heading of nutrition as "poor," "fair," "good" and "over," at the time their physical examinations are made, and later the theoretical weights are calculated from the height and chest measurements and compared with the actual weight. Not infrequently a boy is recorded as "overweight" at the time of the examination whose actual weight is not 20 per cent. in excess. These are borderline cases, as a rule, and usually are not problems, as, under exercise, the condition tends to correct itself. For the purpose of this paper, we have limited our material to a discussion of those children who are not only 20 per cent. in excess, but who, to the casual observer, are unquestionably "fat" or obese.

An analysis of these overweight children shows that they fall into two distinct groups. First, a group with an irregular disposition of the adipose tissue, together with other physical abnormalities which are indicative of endocrine disturbances; and, secondly, a group which might be termed ordinary obesity, in which there is a generalized distribution of the excess fat tissue and there are no other abnormalities that might be considered as evidence of endocrine disorder. In our material the two groups are approximately of the same size.

In the group of nonendocrine obesity, a study of the parents showed that in every instance either one or both parents were overweight. I stress this, as the importance of heredity on the development of obesity in children has been disputed. The question has been constantly raised as to whether, in these children, heredity is the important factor or whether the obesity is due simply to the excessive ingestion of food, as it is well recognized that, when one or both parents are obese, the table is apt to be overloaded with rich food of high caloric value. Although it is impossible to settle this point definitely, it is my impression, from studying the condition of living in these families, that there is an inherited tendency in these children. The few studies of basal metabolism that have been made show no lowering of the normal rate in this type of child when there is no endocrine disturbance. In the second group, one boy presented fairly definite signs of hypergonad secretion, and one a quite typical Frölich syndrome. The others fell into a group with definite pelvic girdle adiposity, considered by some as of pituitary origin and by others as due to lesions of some other of the endocrine glands. Certainly, nothing can be gained by a speculative discussion or classification into types of these cases, in the present uncertain knowledge of the influence of the ductless glands on nutrition and growth. The boys of this group, who, in addition to the attention attracted to them by their obesity, had either an underdevelopment or overdevelopment of the genitalia, present an added problem in their sensitiveness in regard to the abnormal condition. In none of the endocrine cases was there evidence of an inherited tendency to obesity. I consider the differentiation into the endocrine and nonendocrine groups of importance: (1) Because of the statement of some pediatricians that endocrine disorder as a cause of obesity is rare, a statement I do not regard as correct; (2) because of the statement of some of our endocrine enthusiasts that most, if not all, cases of obesity are due to glandular disturbance, a theory for which there is no valid proof or evidence, and (3) because of the therapeutic and prognostic differences.

From the school standpoint, overweight children have been a problem for two reasons: Because of their inability to fit in with the regular play and athletic program and because of their marked tendency to injury. The fat boy is too heavy to fit in with hard exercise or play, such as football, with boys of his own class and age, and too young and immature to play with boys of his own weight but older in years and stronger. In games requiring more skill, such as baseball and tennis, they are decidedly awkward and backward as a group and hence we find them with the tendency to withdraw from competitive play and loaf, with the result that these overweight boys, who are in particular need of exercise, are the ones who have to be continually driven and supervised. Probably as a result of the excessive weight being supported by immature bones and tendons, minor sprains and accidents are unusually frequent among them. Three of the boys have developed epiphyseal lesions; one, a separation of the epiphysis of the anterior tubercle of the tibia (Osgood-Schlatter's disease) and two, a bilateral lesion of the epiphysis of the os calcis, a roentgenogram showing a condition similar to the lesion at the hip in Perthes' disease. The overweight child, however, has not been a problem from the scholastic standpoint, as the group as a whole stands very well in its studies. Thus in a group of twelve in the lower school, whose standings were checked, two were excellent, four good, five fair, and only one poor. Four of them were noted, however, as being "mentally lazy"—a matter of preadolescence rather than obesity, in all probability.

During the first year of our work at the school, no particular attention was paid to the overweight children. Studying our school records at the end of the year, we found the frequency of injury mentioned above, and further that, as a rule, the overweight child put on more weight than the average during his school year and vacation. For the last three years, therefore, we have attempted to control conditions and have found the overweight child even more difficult to manage than the underweight. Part of the explanation for this is the lack or absence of physical defects—excepting the endocrine disorders—among the overweight children, the correction of which aids so materially in the management of undernutrition. Our therapy or corrective measures, therefore, we have necessarily limited almost entirely to dietetic restrictions and to increased muscular exercise. As explained above, the susceptibility of the overweight children to accidents and strains renders increased exercise a difficult practical problem. Our individual records show that the results of many weeks of effort were frequently overbalanced by periods of days or weeks when exercise had to be limited or dispensed with altogether. The question of the limitation of diet raises a very nice theoretical problem as well as a practical one. How far can the diet of a growing developing child be cut down without the danger of injury? After considering this problem for some time and finding nothing of a scientific nature to help in the solution, we decided that our plan would be to hold the child at his weight for an indefinite period. It seemed logical to consider that if this could be done, and suffi-

cient exercise be given at the same time, the child, through the natural processes of growth, would automatically lower his excess of fat tissue. We felt that it might be dangerous to restrict the diet—granted that this were possible—to such an extent that much weight would be lost. Concretely, our plan has been to take off a few pounds by a rigid restricted diet for a week or two and then hold the weight at this level for a long time, always meeting the protein requirements and allowing as many additional calories in fat and carbohydrates as could be utilized without any weight being taken on. From a practical standpoint, this plan has not always been as successful as we had hoped, particularly if results are judged after watching the boys over a long period of many months or years and not just for a short demonstration period. Perhaps the best way to relate our experience is to cite some cases which illustrate our problems and the points that have been raised.

First, the point that the rapid growth which takes place at the preadolescent and early adolescent period tends automatically to correct the obesity, if the child's dietary can be controlled.

A boy, aged 10, in October, 1921, had a height-weight of 80 pounds (36.3 kg.), and an actual weight of 116 pounds (52.6 kg.), an excess of 45 per cent. In October of the following year, his height-weight was 92 pounds (41.7 kg.), an increase of 12 pounds (5.4 kg.), but his actual weight had increased 16 pounds (7.3 kg.), to 132 pounds (59.9 kg.), leaving the percentage of excess approximately the same. A strenuous effort was made with the boy and his parents through the following year. In October, 1923, his height-weight was 106 pounds (48.1 kg.), or 14 pounds (6.4 kg.) more than the previous October. During the year, he had actually gained but 1 pound (0.5 kg.), which brought down the excess to 24 per cent., and this could hardly be called obesity, as his muscular development during this year was quite marked. With the change, there came about a most striking change in the boy's temperament, reaction to work and interest in school life and activity.

Another boy, with a height-weight of 77 pounds (34.9 kg.), and an actual weight of 100 pounds (45.4 kg.), in October, 1922, grew so rapidly during the year that, although his height-weight in 1923 was 99 pounds (44.9 kg.), or an increase of 22 pounds (10 kg.), the actual gain was only 11 pounds (5.0 kg.), bringing the excess down to 12 per cent. over the average weight for his height.

That it is not only necessary to control the child during the school year of eight months, but for much longer periods of time, and that the summer vacation is a dangerous time is well shown by the record of several boys.

Thus, one boy, in October, 1921, had a height-weight of 85 pounds (38.6 kg.), and an actual weight of 119 pounds (54 kg.), or an excess of 40 per cent. During the entire school year, we held the boy's weight at this level or below, and, in May, our last weighing was recorded as 116 pounds (52.6 kg.). On his return to school in October, 1922, we found that, while his height-weight had gone up 13 pounds (5.9 kg.) during the year, or to 98 pounds (44.5 kg.), during the four summer months he had not only made up the 3 pounds (1.4 kg.) lost, but had put on 11 pounds (5 kg.) additional, and so was still 32 per cent. over average weight. After eight months of coercion and persuasion, he left school the following May weighing 136 pounds (61.7 kg.), a gain of 6 pounds (2.7 kg.) during the eight months, during which time, however, he had grown fairly rapidly. On his return in October, 1923, we found that the four months' summer gain had been exactly 15 pounds (6.8 kg.), and so he started off last fall with a height-weight of 107 pounds (48.5 kg.), and an actual weight of 151 pounds (68.5 kg.), an excess of 44 per cent. During the two school periods of eight months he had lost 3 pounds (1.4 kg.) one year and gained 6 pounds (2.7 kg.) the second, while, during the two summer vacation periods of four months duration, he had gained 14 pounds (6.4 kg.) the first year and 15 pounds (6.8 kg.) the second—all of which goes to show that the results of dietetic therapy in growing boys cannot be judged on the results obtained over a few weeks or months, and that long continued control and cooperation is necessary.

The foregoing cases belong to the group of ordinary obesity, and, as a whole, we feel that our results have been fairly satisfactory with this group. In the endocrine group, the difficulty in controlling the weight has been greater. None of the cases we have encountered have been of a type amenable to specific therapy, and the use of glandular extracts in several cases has been without results. No cases of thyroid deficiency were encountered, and we have hesitated to use thyroid extract to increase metabolism, as the metabolism of the cases tested when a lowering of the rate was suspected did not show a decrease. Part of the difficulty with the endocrine cases is explained by the failure of some of the boys to grow taller at the normal or average rate of yearly increase.

One boy, in October, 1921, had a height-weight of 72 pounds (32.7 kg.), and an actual weight of 87 pounds (39.5 kg.). In the fall of 1923, two years later, his height-weight had reached only 75 pounds (34 kg.), while his actual gain, despite restricted diet and close cooperation on the part of the parents, was 16 pounds (7.3 kg.), and thus his excess over average had increased, and his obesity was more striking.

Another endocrine case, of a different type, was that of a boy with a height-weight of 105 pounds (47.6 kg.), and an actual weight of 144 pounds (65.3 kg.) in the fall of 1922. A year later, he had a height-weight of 107 pounds (48.5 kg.), or an increase of 2 pounds (0.9 kg.), and an actual weight of 170 pounds (77.1 kg.), the gain of 26 pounds (11.8 kg.) that year increasing his excess over the average weight for height from 27 to 60 per cent. This boy would diet faithfully for a week or so and then break diet, and gorge himself with food. A broken bone in the foot, sustained during mild play, which necessitated a plaster cast for some weeks, was an important factor.

The question may properly be asked whether it is necessary to bother with or consider the overweight child at all. So far as we know, the degenerative changes that go with obesity in the adult do not occur in childhood; but whether carrying around excessive weight early in life predisposes to a similar condition in adult life is another question on which I can find no data. Perhaps the chief reason for intervention lies in the failure of the child to adjust himself properly to his environment. He is marked out too distinctly from the other children for his own good. The willingness of the boys to cooperate certainly signifies that this is the situation. With few exceptions, we have found both the boys and their parents cooperative; and the way some of them have gone for months without candy, pastry and potatoes and with a carbohydrate intake limited almost entirely to a piece of bread three times a day has shown that the obesity has been undesirable. Considerable ingenuity has to be used to keep the stomach filled and the boy from feeling too hungry when a diet of low caloric value is taken for a long period of time. Thin soups in large quantities, large quantities of greens, and green vegetables become decidedly distasteful after a few months, and in watching some of the children limiting their diet our only wonder has been that they do not break diet more often. Despite the failures, my belief is that our method is right; that is, not to attempt a marked reduction of the weight, but to hold the weight and let the child grow into it, so to speak. The promise that the diet

can be increased as exercise increases and more fuel is consumed, just so long as enough to lead to an increase of weight is not taken, has stimulated exercise remarkably, and boys who have been lazy and indolent in play have taken to sports as they never did before. Patience, cooperation, and perseverance over a long period of time are the essentials in treatment, and, further, we have learned never to be misled into thinking that permanent results have been obtained if the treatment has been limited to a short period of time.

ABSTRACT OF DISCUSSION

DR. I. A. ABT, Chicago: I am fully in agreement with Dr. Veeder's main thesis. He has avoided a consideration of the endocrine group of obese patients. I am also fully in agreement with his caution in this matter. The remaining children who are obese are difficult to account for and to treat. They do not fall into the endocrinopathic class. A certain number of children are obese on account of inactivity for one reason or another. Some are inactive because of convalescence from disease or infection. On the other hand, a large number of children overeat habitually. Certain children with voracious appetites eat between meals; they are badly managed at the table and in the home, and are in the habit of taking much larger quantities of food than they can dispose of. Often we may suspect, in this group of obese children, some primary defect in fat metabolism. They store up great amounts of fat in the tissues. The late, lamented Dr. Holt used to say that normal children, with their metabolic function in full adjustment, rarely eat too much. In this, he is corroborated by Drs. Benedict and Lusk. There is another group in which the food supply is too high, and these children store up large quantities of fat without causing any fatty degeneration. As to treatment, the total amount of food might be reduced one-third or one-fourth, thus diminishing the caloric intake. It is not safe to reduce materially the protein intake, because the children will need this in order to be sustained. They require exercise, and without reasonable protein intake they can hardly maintain full health. I think one is safe in reducing carbohydrates and fats. Occasionally, these children may have a fasting day without any harm, when they may have orange juice, prune juice, water, tea and clear bouillon, and this may be repeated once a week. They should indulge freely in physical exercise, and with such a regimen a moderate reduction in weight may be expected.

DR. F. P. GENGENBACH, Denver: The overweight as well as the underweight child brings into consideration the never ending discussion as to the relative importance of heredity and environment. Goldthwaite has shown that there are three anatomic human types: (1) the normal human; (2) the carnivorous or congenital visceroptotic, and (3) the herbivorous or broadbacked type. He also found at postmortem examinations that the carnivorous type, which is so often associated with underweight, has, on the average, a shorter intestinal tract than the normal human being, while in the herbivorous type, the intestinal tract is apt to be longer than normal. Leaving out of consideration endocrine dysfunction, and also the actual number of calories eaten by children of these two types, is it not possible that the difference in length of the intestinal tract may be a factor causing decreased or increased absorption of the foods eaten? Then, too, there is the difference in the temperaments of the two types—the one nervous, overactive, prone to eat too fast and to digestive disturbances, and with a poor appetite for food; the other, phlegmatic, fond of eating, and taking time to eat properly.

DR. LULU HUNT PETERS, New York: Through a newspaper syndicate health feature, I am in touch with a great many obese people. I get many letters from children, and there is always a tone of unhappiness in these letters. I was an obese child myself, and I know that there is genuine mental suffering in being an obese child. I should like to emphasize the importance of letting the children count their own calories. A child as young as 7 years can usually count his calories and thereby take greater interest in reducing. I allow children to lose weight, but I instruct them not to lose more than one pound a week. Their health will stand this. I have not had any letters complaining of ill effects. I allow three glasses of milk for its complete protein and lime, and I emphasize the liberal use of fruits and vegetables. I also insist on 300 calories of carbohydrates in the form of whole wheat bread, potato, etc. Most obese children eat a lot of candy, and this, of course, they have to cut down markedly. I teach the children that obesity is not inherited, that they may inherit strong stomachs and weak wills, but not obesity. I do not say much about obesity due to glandular disturbance, because such a small percentage is due to this cause.

DR. BORDEN S. VEEDER, St. Louis: Dr. Abt brought out the question of the endocrine glands. I have intentionally tried to avoid going into this subject. Every nutritional condition in children has been attributed to some disease of the ductless glands. To show how far this can be carried, one has only to quote a recent statement that every baby weighing more than 8 pounds (3.6 kg.) at birth is a subject of endocrine disorder. I do not agree at all with the view of some endocrinologists that every obese child is the subject of an endocrine disorder. As stated in the paper, about 50 per cent. of the children in our series were obviously endocrine cases, but in the other 50 per cent. we feel very positive that there was nothing that could be attributed to the ductless glands.

THE DIAGNOSIS AND MANAGEMENT OF HEAD INJURIES*

FRANCIS R. HOLBROOK, M.D.
DES MOINES, IOWA

Until a few years ago, the subject of cranial injuries resolved itself very largely into a discussion of fractures of the skull. At this time, fractures of the skull were thought to be an exceedingly grave condition. Many patients died, thereby supplying incontrovertible evidence in favor of this opinion. But, on the other hand, not a few recovered, and, be it known, at times these were apparently more seriously injured than some of those who died. The question naturally arises, "Why was this so?"

In the light of our present-day knowledge of this subject, the answer to our question is not difficult. We now know that a fracture of the skull per se is not particularly serious and that it becomes a thing of real moment only when complicated by injury to the intracranial structures. This being so, in discussing the subject of head injuries, we must place special emphasis on the status of the intracranial contents, relegating to a place of secondary importance the matter of the skull, which may be intact or may be the seat of a fracture. There is one exception to this statement, and that is depressed fractures of the vault, which must in all cases be recognized and appropriate measures taken for their relief.

While serious intracranial injury can and does occur as a result of trauma that is insufficient to fracture the skull, nevertheless, most cases of intracranial injury are accompanied by the latter condition. Every case of head injury should be regarded as a possible fracture of the skull until definite proof to the contrary is obtained. Simple linear fractures of the vault are frequently impossible of diagnosis without the aid of the roentgen ray. Therefore, every case of head injury should be subjected to roentgen-ray examination.

There are cases in which depressed fractures of the vault can scarcely be diagnosed in any other manner. I refer to the cases in which there is hematoma of the scalp. Under such circumstances, the condition of the

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underlying bone is a matter of conjecture, and its exact status can be determined only by the roentgen ray or by incision of the hematoma and direct inspection of the bone.

We have stated that intracranial injury is the all-important factor in head injuries. How are we to determine the presence or absence of this complication? We know that injury to any of the cerebral structures is accompanied by increase in the intracranial pressure, which, when it reaches a high enough point and is maintained, produces all the serious symptoms commonly observed in these cases and eventually death. How, then, to determine whether we have an increased pressure, and, if so, to what degree? Formerly, our only guide in this condition was clinical symptoms, such as slow pulse, slow respiration, paralysis, coma, symptoms we now know to be due to medullary compression, which is a terminal state, and one wherein it is too late for any relief. The presence of an increased pressure must therefore be recognized before these symptoms supervene, if we are to be in a position to render these patients proper care.

Probably the most important, as well as the most accurate, means at our disposal for the estimation of intracranial pressure is the spinal manometer. By the use of this instrument we are enabled to read, in millimeters of mercury, the exact pressure existing within the skull. Normally, the pressure ranges from 7 to 9 mm., and anything above 15 mm. is to be considered as pathologic. Having determined the pressure in any given case, we should next ascertain whether or not the pressure is increasing, because, if it is, relief must be afforded; otherwise, medullary compression is most apt to result, and we have lost our chance of doing anything worth while for our patient. Subsequent readings, made at short intervals, are to be carried out, and in this way interference or noninterference is clearly indicated.

Much has been said concerning the value of blood pressure in estimating intracranial pressure. It should be taken, of course, as part of a thorough examination of the patient, but my own observations thus far have tallied with those of most observers, who feel that it is too variable to be of much help. Many cases of serious intracranial pressure have occurred in which the blood pressure has not been at all significant, and in which, had the latter been regarded as an accurate criterion of intracranial pressure, no action would have been taken until the development of signs of medullary compression indicated that all hope was lost.

Having determined that, in any particular case, we are dealing with a case of intracranial pressure which demands relief, by what means is this to be accomplished?

The generally accepted opinion has been that cranial decompression affords the only satisfactory plan for dealing with this condition. In the last several years, however, it has been quite conclusively shown that spinal drainage can be employed with perfectly satisfactory results and the increased pressure relieved in this manner. This method has been opposed as hazardous because of the danger of the medulla becoming wedged in the foramen magnum, due to sudden release of the spinal fluid under pressure. I believe that the fear of this accident has been overemphasized, and a search of the literature for reports of this complication has yielded the information that, in many hundreds of spinal taps, sudden death has resulted in a very occasional instance, and this has occurred, in nearly every case, in patients suffering from increased pressure from brain tumors and other chronic conditions. I feel safe in saying that if the spinal fluid is withdrawn with the patient in the recumbent posture and if not more than from 10 to 15 c.c. is removed at a sitting, little, if any, danger will be encountered by this procedure.

The study of the condition of the intracranial pressure in any given patient should begin as soon as the patient rallies from shock. This may be in an hour or so after the injury, in cases which seem to be mild, or it may be delayed a number of hours in severe cases. Cases of head injuries follow the same rules, as far as shock is concerned, as any other surgical condition; viz., nothing should be done during the stage of shock except to treat the shock. When the shock has cleared up, a reading of the intracranial pressure should be made, and if it is found to be above normal, some fluid should be removed, anywhere from 5 to 15 c.c. In three or four hours another reading should be made, and if the pressure is found to have again reached a point in excess of normal, more fluid should be removed. If, however, the reading shows that the pressure has not increased, no fluid should be drawn off, and another reading need not be made for six or eight hours, at which time a normal pressure would indicate that, in all probability, no intracranial damage is present. If an increase in pressure is found, it should be reduced by another withdrawal of fluid.

It is quite well known that increased pressure gives rise to choked disk, but I should like to emphasize the point that if one is to rely on this sign for information as to increased pressure in acute cranial conditions, he will make a serious error, owing to the fact that choked disk is a late sign, and by the time that it occurs, any chances for helping the patient have vanished. The early signs of pressure, as seen in the fundus, consist of an engorgement of the retinal vessels and a blurring of the edge of the optic disk. The blurring of the edge of the disk is the first stage of a choked disk, and any relief that is contemplated should take place long before the disk becomes choked, for by this time the condition within the skull has progressed too far to be benefited by operation.

The other alternative to spinal drainage, in treating increased pressure cases, is decompression, usually by the subtemporal route. If this method is used, a good sized opening in the skull should be made beneath the temporal muscle. The dura should be open to the limit of the skull opening and the temporal muscle sutured over the brain, leaving the dura unsutured.

The operation is best done on the right side of the head to avoid any possibility of injury to the speech area. If necessary, a second decompression operation can be done on the opposite side.

There are two conditions which cause an increase in intracranial pressure to which the foregoing statements do not apply. These are depressed fractures of the vault and extradural hemorrhage. It is quite obvious that all depressed fractures of the vault should be operated on as soon as possible. This is just as much an emergency operation as an acute appendicitis or acute osteomyelitis. The depression should be elevated or removed, and the scalp closed over the defect without drainage, except in a certain few cases of compound depressed fractures.

In the extradural hemorrhage cases, operation must, of course, be performed and the torn vessel ligated just as soon as a diagnosis is made. In most cases of hemorrhage it is the middle meningeal artery that has been

injured. As a rule, these hemorrhage cases are not difficult of diagnosis if the patient is under careful observation from the time of his injury. The most significant symptom of all is the sudden development of unconsciousness after a conscious interval. This should always immediately arouse in our minds the suspicion of an extradural hemorrhage. Following this, the patient will develop signs of pressure and a paralysis corresponding to the area of the brain encroached on. Nothing more is needed in the way of information with which to make a diagnosis. The remedy is plain.

SUMMARY

The following are the important points to be considered in the management of these cases of cranial injury:

1. Shock should be treated first.
2. As soon as possible, the status of intracranial pressure should be determined by direct reading at lumbar puncture, by examination of the eyegrounds, and by observation of symptoms.
3. It should be determined whether pressure is stationary or progressive.
4. Pressure should be relieved by spinal drainage or decompression.
5. All depressed fractures of the vault should be operated on.

Bankers Trust Building.

ABSTRACT OF DISCUSSION

DR. FREDERIC A. BESLEY, Chicago: I have seen skull fractures in my own work as well as in Dr. Jackson's service at Cook County Hospital. He has advocated for many years the practice of spinal puncture for drainage and relief of pressure. Our results have not been satisfactory. There must be a reason for these indifferent results. It is obvious that not all these cases are cases of edema. I have observed post mortem that at least 80 per cent. of skull fractures involve both the vault and the base. I am inclined to believe that the manometer does not show the exact degree of pressure within the cranium. Many factors enter into that situation which materially affect pressure in the spinal arachnoid spaces as compared with pressure in the intracranial arachnoid spaces. Obviously, the closure of the aqueduct of Sylvius or the closure of the space between the third and fourth ventricle does occur. There is another factor. I think it has been definitely shown that there is a space between the dura and the arachnoid which is not drained by draining the arachnoid space. I should like to suggest that at the necropsy we try to determine, by forcing the needle into the arachnoid space of the spine, in what percentage of cases it drains the lateral ventricle. Dr. LeCount has shown that there is edema of the brain in all cases in which death occurs following brain injuries. But there is another factor on which too little stress is laid; that is, the little, fine, petechial hemorrhages that occur throughout the brain. How many see cases without much gross hemorrhage and in which gradually coma develops and then the patient dies? The necropsy does not disclose a massive hemorrhage but it does disclose petechial hemorrhages, and I think that these petechial hemorrhages cause death. Do not misunderstand me; I believe that Dr. Holbrook is right in saying that spinal puncture should be made, and made repeatedly, with manometer check; but so far my results have been disappointing. One thing about the relief of pressure: I am still of the old school that believes in making a large opening in the skull and turning down a flap. I know that this is not orthodox at present, but I have seen many cases come to necropsy in which, if I had gone 1 inch farther, I should have found a large clot which did not give rise to any focal disturbances but which was evidently the cause of death. In desperate cases, it is the only chance.

DR. KELLOGG SPEED, Chicago: I wish we could look on skull fractures and cranial injuries as such a simple matter as edema of the brain. There is certainly much more pathologic significance to that. I agree that hemorrhage is a frequent cause of these lesions. When one studies at necropsy the skulls after these injuries, one finds a surprisingly high percentage of fractures. The roentgen ray will fail to show a base fracture in more than 15 or 20 per cent., so that, as a diagnostic means, it has very little value for that type. It should be used, however. The mere fact that edema occurs will not explain some of the symptoms we see in these lesions. Taking the aphasias, for instance, we must have focal hemorrhages to explain the different forms of aphasia that occur so frequently. In spite of having used spinal puncture ever since Quincke's time, we still find that the mortality in skull fractures is around 50 per cent. Some years, in a hospital service, it may go down to 40; but on the average it is still 50 per cent., just what it was fifteen or twenty years ago. Spinal puncture will help in some cases. For practical purposes, we can divide skull fracture into three classes. The first class includes the moribund cases. They have pallor, disturbed respiration, and one knows that these patients are going to die. No amount of spinal puncture or decompression will help. Along with this class are the open or compound fractures, many of which will survive if infection is kept out because they have decompressed themselves by an opening in the skull. The second class presents signs of increased intracranial pressure. I am not trying to classify them particularly, but they may have unconsciousness, slow pulse, rise in blood pressure or rise in spinal pressure, and they are subjects for treatment by spinal puncture. In the third class there is some disturbance in consciousness or respiration, but not coma. These patients will get well without spinal puncture and without decompression or other treatment except rest in bed. One cannot tell by the spinal manometer just exactly what the intracranial pressure is. It furnishes an indication in some cases of increased intracranial pressure, but just as we have come to disregard the absolute findings of blood pressure, we surely eventually will disregard the absolute findings of the spinal manometer.

DR. GEORGE W. SWIFT, Seattle: Dr. Holbrook has dwelt on a phase of the subject of brain injuries, namely, edema of the brain, which is quite important, but he failed to emphasize the eye findings in these cases. I have always been accustomed to expect choked disk in intracranial lesions. As a matter of fact, in acute head injuries there is only one type that gives choked disk, and that is an arteriovenous aneurysm in the cavernous sinus. There is another important eye finding in edema of the brain which is also of great importance; that is, a congestion on the surface of the disk. This is due to a retardation in the venous return from the cranium. We consider this so important that in the last five years in Seattle City Hospital every intern has been taught to use the ophthalmoscope and to look for this particular condition in all cases of head injuries. Regarding the use of spinal drainage, one cannot always obtain permission to tap the spine. This is especially true in small communities, and something must be done to control the edema in head injuries. In such a case, the use of magnesium sulphate is indicated. In this, I concur with Dr. Holbrook. The time to treat brain injuries is at the time of the injury, not six months or a year later. Certain cases do not respond to any treatment, but others will respond, and that is the time to institute treatment.

DR. M. E. BLAHD, Cleveland: The guide I have always used in diagnosis, in these cases, is whether the patient is momentarily unconscious or whether he is unconscious for a protracted period. The patient who is only momentarily unconscious, or not unconscious at all, one need not worry about. Practically, every one of those patients will get well without treatment, unless there is a compound fracture. As far as treatment is concerned, I do not believe that any treatment is necessary when they are in deep coma. I do not believe that there is any treatment of very great value because every patient who is in deep coma is in a state of severe shock, and a decompression operation on such a patient is sure to be fatal. As far as lumbar puncture is concerned, I know nothing of its value in diagnosis or treatment. I cannot see how draining 5, 10, 15 or 20 c.c. of spinal fluid will relieve any intracranial tension when we consider how quickly spinal fluid is reformed. I agree with Dr. Speed that if these patients are left alone we

shall get as good results as when they are drained or otherwise operated on. In a fairly large series of cases, we have had a mortality in head injuries of 37 per cent. I think that a part of the mortality rate is due to the fact that when we first started we were too enthusiastic and operated in too many of these cases. In the last few years we have operated in practically none, except those in which there was extradural or intradural hemorrhage. In those cases, decompression practically always cures.

DR. FRANCIS R. HOLBROOK, Des Moines, Iowa: I agree with Dr. Speed and Dr. Besley that lumbar puncture has its limitations. It is not advocated as a panacea or as a 100 per cent. measure. It is at least a rational form of treatment. One has to do something for these patients. Many of them do not need it, but I spoke of those that do need something in the way of treatment. While it will not save all patients, it will have a good effect in a large group of cases. Regarding Dr. Speed's remarks about the manometer, it is true that it is not absolutely accurate; but formerly we did not have anything at all to go on. We waited until the patient sank into coma with respiration of 5 or 6 a minute and a heart rate of 20 before we got any indication of the pressure. The spinal manometer gives an indication of the intracranial pressure. It may not be accurate, but it is a big help. As to Dr. Blahd's remarks about operating on a patient in shock, no one operates on a patient in shock; there is nothing to be gained by so doing. The decompression operation, as he said, is strictly limited to those cases presenting focal signs of either foreign bodies or extradural hemorrhage.

THE CURE OF SCARLET FEVER COMPLICATED WITH ERYSIPELAS AND STREPTOCOCCUS SEPTICEMIA

BY INTRAVENOUS INJECTION OF MERCUROCHROME-220 SOLUBLE

HUGH H. YOUNG, M.D.
AND
KONRADE BIRKHAUG, M.D.
BALTIMORE

In conjunction with Miss Hill, one of us has reported[1] a series of cases in which septicemias and localized infections had been cured by intravenous injections of mercurochrome-220 soluble.[2] Since this paper appeared, many other patients have been subjected to the same treatment. Most of them were similar to the cases detailed in our paper. The two cases presented here, however, are quite different in type and demonstrate a wider field of usefulness for mercurochrome. The results obtained in a case of very severe scarlet fever with complications and in a second case of streptococcus pneumonia are so striking as to warrant their publication. A short time ago, confident that mercurochrome would be of great value in severe cases of scarlet fever associated with streptococcus infection, which Dochez and others have shown to be the causative agent in scarlet fever, we obtained permission of Dr. Birkhead Macgowan, director of the Sydenham Hospital for Infectious Diseases, to use the drug in such cases, especially those in which the serum treatment had been tried without success (Case 1).

REPORT OF CASES

CASE 1.—M. A., a boy, aged 4 years, was admitted to Sydenham Hospital, March 2, 1924, with flushed cheeks, discharging nose, sordes on the lips, the entire faucial ring deeply strawberry red, and both tonsils slightly enlarged, amembranous, cryptic and slightly exudative. The temperature was 103.2 F., the pulse, 135, and the respiration 28. A diagnosis of scarlet fever was made.

March 4, the seventh day of the disease, tachycardia and toxic symptoms were increased. The patient became very drowsy, unwilling to partake of food or fluids, and frequently cried about the angina of the neck. The faucial ring had not abated in the intensity of the strawberry red injection. The cervical glands were rapidly growing in size and increasing in tenderness. During the afternoon, diffuse redness over the right cheek developed. The right eyelids became markedly swollen and injected, and could not be opened. The development aroused suspicions of erysipelas. The temperature was 104.4 during the entire afternoon; the pulse, 138, and respiration 34.

March 5, the anginal condition had progressed so that the patient opened his mouth with difficulty and with considerable pain. The cervical glands were boardlike in consistency but not fluctuating nor readily movable, although the overlying skin was free. The erysipelas of the right side of the face had extended rapidly from the angle of the jaw toward the supra-orbital area in the midline, involving the eyelids heavily. Induration and hyperemia were marked. The toxic condition of the patient was aggravated; he was restless, resisted taking fluids and food, vomited profusely at 8:30 p. m., and passed loose stools during the evening. The spleen was large and tender, and lymph nodes in the axillae and the groin were palpable. The skin was very hot, dry and scaly. The blood examination revealed: leukocytes, 30,600; polymorphonuclears, 82 per cent.; polymorphonuclear basophils, 0; polymorphonuclear eosinophils, 4 per cent.; lymphocytes, 11 per cent., and mononuclears and transitionals, 3 per cent. On account of the growing toxic symptoms and complications, it was thought advisable to use Dochez' antistreptococcic scarlatinal serum. At 10:30 p. m., after a preliminary sensitization test had proved negative, 40 c.c. of the serum was injected intramuscularly in the right buttock.

March 6, at 9 a. m., a slight drop in the temperature was noted after the serum injection, from 104 to 101.6, and the pulse from 140 to 100, but the toxic symptoms were as marked as they were before the serum injection. The erythema of the face had spread beyond the midline of the face, and had widened in all directions, at least 3 cm. during the last twelve hours. The redness seemed much the same, and the subcutaneous induration was still boardlike; no vesicles had formed. The cervical glands were remarkably hypertrophied and firm in consistency. The fauces were deeply injected; the tonsils, large, cryptic and nonmembranous; the tongue was dry and strawberry red, and the papillae were strikingly enlarged. The white blood cells were 28,560; polymorphonuclears, 87 per cent.; polymorphonuclear eosinophils, 0; lymphocytes, 8 per cent., and myelocytes and transitionals, 5 per cent.

At 10 p. m., the same day, the general condition was unchanged. The toxemia persisted and the patient was semidelirious. The erysipelas had spread to the malar prominence of the left cheek, forming an area 5 cm. in diameter. The erythema on the right side had extended to the entire ear, under the angle of the jaw and backward to the midline in the occipital region, the color being everywhere deep red and the subcutaneous induration and the edema very heavy and firm. The temperature had risen to 104.2. The patient had vomited frequently; the stools were loose; occasional chills

1. Young, H. H., and Hill, Justina H.: Treatment of Septicemia and Local Infections by Intravenous Injections of Mercurochroma-220 Soluble and of Gentian Violet, J. A. M. A. 82:669 (March 1) 1924.

2. We have had so many requests for details of the technic used that it seems well to state them here. A simple 1 per cent. solution is made with hot distilled water, using the ordinary tablets of mercurochrome-220 soluble. It is not sterilized, as it is sufficiently antiseptic. A good vein is selected (generally at the bend of the elbow), and the injection is made slowly with a large sterile glass syringe. At least 5 mg. per kilogram of body weight should be employed. This amounts to about 23 c.c. of a 1 per cent. solution of mercurochrome to each hundred pounds of the patient's body weight. In Case 1, 7.5 mg. per kilogram were given (34 c.c. of a 1 per cent. solution per hundred pounds), practically without reaction. In some cases, marked nausea, followed by severe diarrhea follows, but this ceases after a day or two. As was remarked in the first paper, when dealing with a desperate case, in which the only hope of cure lies in introducing the drug in sufficient quantity to sterilize the blood, and if possible the local focus, the initial dose should be large. We have never used more than 8 mg. per kilogram. The treatment is not repeated for several days, and then only if necessary. In the use of gentian violet, we now employ a 0.5 per cent. solution and give 5 mg. per kilogram (46 c.c. of a 0.5 per cent. solution per hundred pounds). The reactions from gentian violet are not gastro-intestinal. It is noteworthy that, in Case 1, albumin and casts that were present in the urine before treatment disappeared after the intravenous injection of mercurochrome, 7.5 mg. per kilogram.

had taken place, and the delirious status remained unchanged. The blood examination revealed: white blood cells, 34,500; polymorphonuclears, 83 per cent.; polymorphononuclear eosinophils, 0; lymphocytes, 15 per cent., and myelocytes and transitionals, 2 per cent. A blood culture was made, with 1 c.c. of blood in meat agar infusion; there were thirty-eight colonies of *Streptococcus hemolyticus*, the area of hemolysis being 2 mm. per colony, after twenty-four hours' incubation.

March 7, at 11 p. m., the temperature had risen steadily to 106 F., and the pulse to 145. The drowsiness and deliriousness remained unchanged, and the erysipelas had extended, in all directions, about 2 cm. during the last twenty-four hours. The child had vomited three times. The urine showed one plus albuminuria, with many white blood cells, and a few granular casts. The blood examination revealed: white blood cells, 32,780, of which polymorphonuclears were 85 per cent.; polymorphonuclear eosinophils, 0; lymphocytes, 7 per cent., and myelocytes and transitionals, 8 per cent.

March 8, at 9 p. m., the temperature was again 105, the pulse 140, and respiration 37. There was no improvement in the general condition. The erysipelas had spread markedly behind the right ear and into the occipital region; the tenderness was acute, and the skin was strikingly hyperthermic. The glands at the angle of the jaw, on each side, were still much enlarged. The faucial ring was unchanged. The general condition was aggravated. The urine showed two plus albumin, many white blood cells and red blood cells and a few granular casts and bacteria. The blood culture was the same as that of the 6th; *Streptococcus hemolyticus* was definite in the subculture. The blood examination at 9:05 p. m. revealed: white blood cells, 36,960; polymorphonuclears, 87 per cent.; polymorphonuclear eosinophils, 0; lymphocytes, 9 per cent., and myelocytes and transitionals, 4 per cent. As the patient was steadily growing worse, the condition was desperate, the injection of serum three days before had not arrested the progress of the disease, and the patient had thereafter continued to grow worse, it was decided to administer mercurochrome-220 soluble intravenously.

March 8, at 9:10 p. m., an intravenous injection of 15 c.c. of 1 per cent. solution, equal to 7.5 mg. per kilogram of the patient's body weight, which was 20 kg., was given. The blood examination two hours later (11:08 p. m.) revealed: white blood cells, 22,900; polymorphonuclears, 61 per cent.; polymorphonuclear eosinophils, 0; lymphocytes, 34 per cent., and the myelocytes and transitionals, 5 per cent. The platelets were increased. There was no basophilia or eosinophilia. There was no marked reaction as a result of the intravenous injection of the mercurochrome.

March 9, the general condition of the patient had markedly improved, particularly in the mental status which was now clear and atoxic. He talked with the nurses and preferred sitting up in bed most of the time. The deliriousness had entirely disappeared. The redness of the face was less intense, and there had been no untoward symptoms following the injection of mercurochrome; no nausea, vomiting or diarrhea were observed. He had been voiding freely and the urine showed definite fluorescence of mercurochrome; likewise, traces of the chemical had been found in the stools. The most striking feature was the complete sterilization of the blood as early as twelve hours after the injection of mercurochrome. It was not thought advisable to disturb the patient during the night for a blood culture.

The following cultures were taken.

9:05 a. m. (12 hours after injection): No colonies grown (confirmed subsequently).

11:30 a. m. (fourteen hours after injection): No colonies grown (confirmed subsequently).

4:20 p. m. (seventeen hours after injection): No colonies grown (confirmed subsequently).

There was a drop in the temperature from 105 to 101, within fifteen hours after the injection, and likewise in pulse rate from 140 to 98 within the same period. The blood examination revealed: white blood cells, 15,200; polymorphonuclears, 84 per cent.; polymorphonuclear eosinophils, 2 per cent.; lymphocytes, 11 per cent., and myelocytes and transitionals, 3 per cent.

March 10, the redness of the face had almost entirely disappeared, and the subcutaneous edema was mostly absorbed, except in the upper portion of right ear, which was still deeply red and markedly tender to the touch. Desquamation was in full progress over the entire face, affected by the exanthem. The eyelids were apparently normal, and there was no residual conjunctivitis. The sordes had almost gone; the tongue was moist, less intensely red, and the recession of the papillary hypertrophy was extraordinary. The entire faucial ring was reduced to normal, except for slightly enlarged tonsils. Otherwise, the physical examination was negative. Mentally, the patient was alert and talkative, and appeared comfortable. There have been no untoward constitutional symptoms since the injection of the mercurochrome. The temperature rose to 105.6 F., and the pulse to 146, and fell during the afternoon to 102, and the pulse to 100. A blood culture taken at 7:35 p. m. (forty-six hours after injection) showed no colonies (confirmed on examination several days later). The blood examination revealed: white blood cells, 14,460; polymorphonuclears, 79 per cent.; polymorphonuclear eosinophils, 1 per cent.; polymorphonuclear basophils, 0; lymphocytes, 13 per cent.; mononuclears, 4 per cent., and transitionals, 3 per cent.

March 11, the temperature was 99.8; the pulse rate, 88, and the respiration, 28. There was remarkable improvement in the facial condition. The injection and the edema had entirely disappeared, and the right ear was quite normal in appearance. The cervical glands were slightly palpable, and the faucial ring showed nothing remarkable, the color of the mucous membranes being pale, the tonsils diminished in size and not tender to pressure. The white blood cells were 9,160.

An examination of the stools made by Dr. W. W. Scott at 4 a. m., March 9 (seven hours after the injection of mercurochrome) showed them to be semisolid, pinkish yellow, and definitely stained with mercurochrome. At 8:30 a. m. (eleven and a half hours after the injection of mercurochrome) there was rather a high concentration of mercurochrome. At 4 p. m. (nineteen hours after the injection of mercurochrome) there was no microscopic blood or mucus; there was a moderate amount of mercurochrome. In the stools at 11 p. m. (twenty-six hours after the injection) no mercurochrome was found, no blood and no mucus.

March 12, the patient's progress had been uneventful. The face was normal in appearance, of good color, and erysipelatous redness and edema had entirely cleared away, leaving behind a thin layer of desquamation. The fauces and tonsils were almost normal; the cervical glands were slightly enlarged and somewhat tender to pressure. The chest, abdomen and extremities were normal. The urinary output was good. There was no albuminuria. This showed remarkable improvement since the injection of mercurochrome. The temperature was 100; the pulse rate, 98, and the respiration, 30, at 8 a. m. At 8 p. m., the temperature rose to 103.6. On physical examination, the patient showed nothing definite except enlargement of the cervical glands. The blood examination revealed: white blood cells, 12,400; polymorphonuclears, 79 per cent.; polymorphonuclear eosinophils, 1 per cent.; polymorphonuclear basophils, 0; lymphocytes, 13 per cent.; mononuclears, 5 per cent., and transitionals, 2 per cent.

March 13, the general condition was good. There were no untoward symptoms. The cervical glands were not palpable. The fauces showed nothing remarkable. The tonsils were normal. The temperature was 97; the pulse rate, 84, and respiration 22 at 8 a. m., and the temperature was 97.2 at 8 p. m.

The blood examination revealed: white blood cells, 9,160; polymorphonuclears, 81 per cent.; polymorphonuclear eosinophils, 1 per cent.; polymorphonuclear basophils, 0; lymphocytes, 13 per cent.; mononuclears, 3 per cent.; transitionals, 2 per cent.

March 14, the patient looked fine. The temperature was 98.4; the pulse rate, 94; the respiration, 24. Blood examination revealed: polymorphonuclears, 78 per cent.; polymorphonuclear eosinophils, 1 per cent.; polymorphonuclear basophils, 0; lymphocytes, 16 per cent., and mononuclears, 5 per cent.

Every day the urine had been examined, and the following changes had been noted from time to time: Before the injection of mercurochrome, the urinalysis showed two plus albumin, and numerous hyaline and granular casts. The specific gravity was about 1.021. There were also numerous white blood cells and red cells, and a stained specimen showed both bacilli and cocci in large quantity in freshly voided urine. A specimen of urine taken twenty-four hours after the intravenous injection of mercurochrome showed a remarkable change in that the urine had become clear, the red and white blood cells had apparently disappeared, no casts were seen, and there was no trace of albumin. Cultures taken from the urine also showed no infection, and subsequent studies have also shown that the urine was absolutely sterile. One week after the injection of mercurochrome, urinalysis was as follows: specific gravity, 1.016; acid reaction; amber; absolutely clear; no albumin. Microscopically, it showed just a few epithelial cells and occasional white cells. There were no bacteria.

March 16, the patient's condition was excellent. The infection of the throat and glands had disappeared. The temperature was normal. The urine was normal. The patient was discharged.

This case was an example of scarlet fever with the most malignant form of streptococcus infection. The result obtained, however, was no more remarkable than that detailed in a report of a case received from Dr. George Martyn of Los Angeles.

CASE 2.—A patient with rapid pneumonia beginning with the left lower lobe, with swollen, painful joints, following a dental extraction, remained in this condition for several days; then the right lower and middle lobes became infected. The temperature ranged from 102 to 104 typically septic; cultures gave *Streptococcus hemolyticus*. There were no pneumococci. The patient was rapidly going down; the temperature was 104; she was cyanotic; the pulse was 140, and every joint was swollen. At this time the article on mercurochrome-220 soluble[1] was seen, and immediately the solution was made up and 20 c.c. was administered intravenously, 5 mg. of 1 per cent. mercurochrome being allowed to each kilogram of body weight. Within an hour, she began to show rigor, which continued severely for three hours, the temperature going up to 105. Then profuse perspiration began; this was followed by sleep. The next morning the temperature was 99.6, the pulse 96. She began to expectorate freely, the tongue cleaning. She had eight bowel actions in the first twelve hours, the appetite coming back rapidly. The most gratifying result of all was the cessation of all joint symptoms immediately. The temperature has remained below 100 ever since, and today her temperature is normal. There is no doubt that this drug saved the patient's life.

Postmortem Examinations.—The method of making postmortem examinations most generally followed . . . is that originally taught by Virchow. The strongest adverse criticism which can be made of the method is that it works best when the various organs in the body are nearest normal. Its chief fault lies in the early separation of the different structures from each other, so that interesting pathologic relations are often overlooked and destroyed. . . . Two other methods of making postmortem examinations were developed besides that of Virchow's, but have never attained the same general recognition, although both contain principles of great value. The technic of Rokitansky, lately best exemplified by Chiari, appeared in printed form a number of years ago. Its fundamental principle is to examine and open every organ in situ before removing it, so that all abnormal relations between organs, blood vessels, and other structures can be discovered and preserved intact. Recently, Hauser has published Zenker's postmortem technic. Its main principle is to remove the organs in block, so that they can be examined from every side and incised before they are separated from each other. Mallory and Wright: Pathological Technique, Ed. 8, Philadelphia, W. B. Saunders Company, 1924.

THE DICK TEST

SOME SUGGESTIONS FOR ITS PRACTICAL APPLICATION *

WESLEY E. GATEWOOD, M.D.
IOWA CITY

When the skin test for susceptibility to scarlet fever was reported by G. F. and Gladys H. Dick,[1] it seemed to me that I might at once make some practical application of their discovery. I proposed first to determine the reliability of the test by employing it as a routine in all cases of scarlet fever admitted to the isolation hospital, both early and late in the course of the disease. I also hoped to test the susceptibility of those who had come in contact with scarlet fever in the general wards of the University Hospital. If the test proved reliable and an active immunity could be developed, it seemed that the test might be used to determine the susceptibility of various persons who are frequently exposed, determining which ones should be immunized. Further, as it is frequently necessary to isolate patients who are suddenly taken ill with erythema and other symptoms suggestive of scarlet fever, but in whom sufficient signs are lacking to make a definite diagnosis, it was hoped that this intradermal test might be helpful in arriving at an early diagnosis. This would economize hospital space, particularly at times when scarlet fever and diphtheria are unusually prevalent, since it would permit us in some instances to distinguish between scarlet fever and the noncontagious erythematous conditions; patients with the latter might be returned to the general hospital if they were found to be immune to scarlet fever. With mild scarlet fever it has often been necessary to wait for desquamation or other corroborative signs to prove the diagnosis.

When a group of nurses, students or patients has been exposed to scarlet fever, it would be of considerable value if, by such an intradermal test, those who are susceptible could be segregated and those who are not susceptible permitted to go free. If an antitoxin was available or if an active immunity could be developed without the disease actually being contracted, the Dick test might prove of value in recognizing those who are susceptible and in need of active or temporary passive immunity after exposure to scarlet fever. In other words, just as has since been suggested by various investigators of the scarlet fever problem, especially Dochez,[2] it seemed from the reports of the Dicks that the disease in its chief manifestations is like diphtheria and that the Dick test might be useful in the same manner as the Shick test.

Dr. George F. Dick provided a small supply of the diluted toxin, which was exhausted in the tests. An attempt was made to prepare our own toxin, cultures being taken of the throats of some of the persons with scarlet fever, and filtrates from the broth cultures being prepared. A moderately concentrated toxin was obtained, but as the detail of the method of the Dicks was not known, the solution was not concentrated sufficiently to eliminate the nonspecific protein reactions and still give strong specific scarlet-fever toxin reactions. Naturally, there are certain optimal cultural methods or conditions for the preparation of this toxin, just as with diphtheria toxin and tetanus toxin. This

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* From the State University of Iowa College of Medicine.

1. Dick, G. F., and Dick, Gladys H.: A Skin Test for Susceptibility to Scarlet Fever, J. A. M. A. **82**: 265 (Jan. 26) 1924.
2. Dochez, A. R., and Sherman, Lillian: The Significance of Streptococcus Hemolyticus in Scarlet Fever, J. A. M. A. **82**: 542 (Feb. 16) 1924.

part of the work was started by F. W. Mulsow, and, when scarlet fever is again prevalent, further investigation will be carried on. The technic of the intradermal tests was that described by the Dicks.

Forty-seven patients with scarlet fever were tested one or more times. Among these were twenty-six who were not tested until at least five days after the onset of the illness. These twenty-six gave either a faintly positive or frankly negative reaction. Ten persons, tested between the third and eighth day for the first time, gave strongly positive reactions at first; but later, tested between the twenty-fifth and twenty-eighth days they developed negative reactions. Ten were tested between the third and eighth days and gave positive tests, but were not tested later. One patient with severe scarlet fever gave a positive reaction as late as the eighteenth day. From these few data it is evident that an estimate cannot yet be made of the time required for the development of an active immunity to the streptococcus of scarlet fever. As stated by Dick in a personal communication, "the variation in the time that different patients develop immunity to scarlet fever is probably due to variations in their susceptibility preceding the attack, to the amount of the toxin absorbed from the throat, and to the individual variations in antitoxin formation." Only one negative test was found early in the disease. All tests should be made as early as possible in the disease, preferably in the first twenty-four hours.

Twenty physicians and nurses were tested. Ten gave a negative history and a negative reaction. Five gave a positive history of definite scarlet fever and had entirely negative skin reactions. Four gave a negative history and had well marked positive skin reactions. One nurse, who one year ago had definite scarlet fever, gave a strongly positive test.

Sixty-five junior medical students were tested. Among these, fourteen gave a history of having had scarlet fever, and thirteen gave entirely negative reactions. The fourteenth, who stated that she had had scarlet fever with extensive rash and desquamation eleven years before, gave a moderately positive reaction. There was no history of scarlet fever in fifty-one. Among these were fifteen positive reactions, twelve strongly positive and three weakly positive. Thirty-six had negative or faintly positive reactions. One student with a faintly positive intradermal test, about six weeks after the test was performed, developed a typical scarlet fever with the usual prodromal symptoms, then a typical angina, strawberry tongue, high fever, general erythematous rash and finally profuse desquamation. His skin test remained practically negative in the course of the disease.

More than 160 tests have been done. Among these were only the following possibly false reactions: (1) a positive intradermal test in a nurse as late as the eighteenth day of scarlet fever; (2) a strongly positive reaction in a nurse one year after she had had scarlet fever; (3) a positive reaction in a student who had scarlet fever eleven years before, and (4) a negative test indicating immunity in a student who developed scarlet fever six weeks later, the reaction remaining negative. Possibly the latter student, for some peculiar reason, does not react to intradermal injections of toxic substances. The same accurate controls as are applied in the Shick test could not be used. The first three apparently false positive reactions may have been pseudo-positive reactions similar to those sometimes obtained with the Schick test.

From the reports in the literature and from the experience here reported, it seems that this test may serve as an aid in the early diagnosis of scarlet fever. Early, a positive reaction is an additional proof of the disease being scarlet fever, and a negative test is against scarlet fever; late, a positive reaction is against the diagnosis of scarlet fever, provided sufficient time has elapsed for the development of immunity.

For example, a boy of 16 was seen with an acute glomerular nephritis and an acute otitis media with a left mastoiditis. Two weeks before the onset of the earache he had been exposed in the school to several cases of scarlet fever, and after exposure had been confined to his home. There had been definite angina, no eruption while he was carefully observed by his mother and his physician, a well marked glossitis and a little malaise, no nausea or vomiting, and slight fever just before the onset of the ear trouble. The Dick test was done about twenty-eight days after the last known exposure, and was strongly positive. If the test is reliable and the reaction a true positive, it would have to be concluded that the conditon was not scarlet fever or a complication of unrecognized scarlet fever.

FURTHER STUDIES ON THE ACTION OF BOTULINUS TOXIN *

C. W. EDMUNDS, M.D.
AND
GEORGE F. KEIPER, JR., A.B.
Professor of Materia Medica and Therapeutics, and Assistant in Pharmacology, Respectively, University of Michigan Medical School
ANN ARBOR, MICH.

In May, 1923, in collaboration with Long, one of us [1] reported on some results obtained in animals with the toxin of botulism. Our findings, in brief, were that in all cases there was a more or less complete curare-like action on the endings of the motor nerves to the voluntary muscles, producing a certain degree of paralysis of the muscles. The phrenic nerves also being affected, the paralysis involved the diaphragm early, the life of the animal being maintained by the accessory respiratory muscles until they too became so weakened that they could not function adequately, and consequently failure of the respiration closed the picture. Complete paralysis of the motor nerves was not present in all cases, but even in those nerves the stimulation of which would result in a motor response, the curare-like action was still to be seen in the early fatigue of the nerve, a phenomenon characteristic of incomplete curare action.

Certain other nerves than those mentioned are involved in the paralysis, special mention being made of the vagus, which was found inactive in some cases and only feebly active in others. Finally, it was pointed out that all the clinical symptoms of botulism, which are purely motor in character, may be explained by this peripheral action of the toxin without calling in any other action whatsoever; at the same time, the fact

* From the Department of Materia Medica and Therapeutics, University of Michigan Medical School.

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author, on request.

1. Edmunds, C. W., and Long, P. H.: Contribution to the Pathologic Physiology of Botulism, J. A. M. A. **81**: 542 (Aug. 18) 1923; Tr. A. Am. Phys. **38**: 210, 1923.

that there might be an action on the central nervous system was not denied. It was pointed out that the findings were extremely contradictory; changes described by one set of workers as being characteristic for botulism many times could not be demonstrated by others.

At the time the paper cited above was written, no other paper was known to us in which a curare action had been ascribed to this toxin. Some time later, however, a reference was found to a report by Schübel,[2] made at a meeting of the Physikalisch-medizinische Gesellschaft at Wurzburg, in which this action was described. In this report, Schübel stated that he had been able to demonstrate a curare action of the toxin on frogs and also degenerative changes in the spinal cords of these animals. His complete paper [3] appeared later.

About two months after Schübel's paper, the first of two papers by Dickson and Shevky [4] appeared, in which a peripheral action of the toxin was discussed. An earlier report [5] had been made in which Dickson described a blocking in the nerves of the craniosacral autonomic system, but stated that the skeletal motor nerves were unimpaired and the reflex arc not disturbed. The latter statements would seem to point to the fact that Dickson had not at that time discovered the changes in the peripheral motor nerves. The appearance of these papers is of considerable interest, since they are the first in which attention is directed toward the peripheral nervous system as being the seat of the toxin action. It is true that some clinicians had suggested the possibility, but, of course, in cases of human botulism poisoning, it could not be other than a suggestion.

In a later paper,[6] Dickson and Shevky say that they could find no blocking of impulses in the nerves going to the skeletal muscles nor any true paralysis; but they did find a marked susceptibility to fatigue in the endings of the motor nerves. They were unable to find any degenerative changes in the spinal cord of warm blooded animals, such as were described by Schübel as occurring in frogs.

Many other papers than those mentioned have appeared in the last year on the general subject of botulism, or on some special phase of the question, but none that deal especially with the pathologic processes underlying the clinical manifestations.

Our own work of the last year has been mainly along two lines: (1) To explain more fully some of the symptoms of the intoxication; and (2) to investigate some of the therapeutic possibilities suggested by the results of the physiologic work. Our first experiments were carried out on frogs, as these animals are especially favorable for the study of a curare action.

FROGS

In the previous paper we stated that we had been unable up to that time to obtain any effects in frogs following the injection of the toxin. Since then our investigations in these animals have been aided by having at our disposal a much more powerful toxin. In addition, we have subjected the frogs to a slightly higher temperature, doubtless accelerating the action of the toxin. After injecting the toxin into the anterior lymph sac, we placed the animals in a large tank, the bottom of which was covered with water which was maintained at a temperature of from 20 to 22 C. One end of the tank was partitioned off and here normal frogs were placed to act as controls for any possible effect of the increased temperature. No changes were ever observed in these control animals. In the injected frogs, no changes were noted for about five days, when it was seen that they were becoming much distended, the abdominal walls were growing considerably relaxed, and the animals seemed to be lying much flatter on the bottom of the tank. They would move if stimulated and make more or less successful attempts at jumping, and, in the same way, they would turn over if placed on their backs. During the following days, the weakness became more marked; movements of all kinds appeared more difficult, but practically never was the paralysis complete. It was always possible to obtain some motor response to adequate stimuli.

If, in such animals, the sciatic nerves were stimulated in the usual way, by placing electrodes to the base of the spine, the hind legs were promptly extended and, for a moment or so, would be rigid; but, with continued stimulation, the response became weaker and intermittent, the muscles contracting and relaxing rapidly. Finally, only a slight response was obtained, paralysis being practically complete. Since direct stimulation of the muscles produced a normal response, the trouble was evidently in the connecting mechanism between the nerve and the muscle; that is, in the nerve ending. The picture presented by these frogs, so far as these peripheral effects are concerned, is almost precisely that shown by atropinized frogs in which, too, an incomplete peripheral paralysis is present. A similar action is produced also by a number of other alkaloids, such as some of the morphin group, and even by curare itself in a certain stage of its action. A study of this subject was carried out in this laboratory a number of years ago by Hale.[7] A more definite localization of the point of attack of the toxin was not attempted, since there does not seem to be the slightest doubt that it is on the nerve-end proper and not on the receptive substance. Edmunds and Long proved this to be true in the action of the toxin in chickens, and doubtless the same is true in frogs.

Effect of Physostigmin on Botulinus Frogs.—In the earlier paper, it was suggested, on the theory that the action of the toxin was on the nerve ends, that as physostigmin is an antagonist of curare, it should be tried against the toxin of botulism. Accordingly, varying doses of the alkaloid were injected into frogs showing different grades of intoxication, but in no case was any improvement noted.

After we had obtained these effects of the toxin on frogs, we found Schübel's paper, to which reference was made. It was gratifying to know that he, too, had discovered the curare-like action of the toxin on frogs; the work of one confirming that of the other.

PIGEONS

The effect of the intraperitoneal injection of toxin into pigeons resembles very closely its effect on cocks, a description of which was given in the earlier paper.[1]

DOGS

In addition to the action of the toxin on the motor nerves, the causes of certain other symptoms that are described in human botulism were studied on dogs. The most important of these, for which a physiologic basis was sought, was the condition of the salivary

2. Schübel, K.: Deutsch. med. Wchnschr. **47**: 1047, 1921.
3. Schübel, K.: Arch. f. exper. Path. u. Pharmakol. **96**: 193, 1923.
4. Dickson, E. C., and Shevky, R.: J. Exper. Med. **37**: 711 (May) 1923.
5. Dickson, E. C.: Proc. Soc. Exper. Biol. & Med. **18**: 313, 1920-1921.
6. Dickson, E. C., and Shevky, R.: J. Exper. Med. **38**: 327 (Oct.) 1923.
7. Hale: Am. J. Physiol. **23**: 408, 1909.

mechanism and the condition of the internal muscles of the eye.

Saliva.—The condition of the secretions of the mouth has aroused considerable interest. According to Dickson,[9] patients usually complain of extreme dryness of the mouth, but occasionally there is an increase in the amount of saliva. In a later paper,[4] he and Shevky described a "block" as occurring on the course of the chorda tympani, similar to that described on the vagus. In a still later paper,[6] he and Shevky discuss the effect of botulinus on the salivary flow, in the light of their experimental work, and speak of the absence of the serous portion of the saliva. He says he has never seen salivation either in human cases or in animals, and that any apparent salivation may be due to movements of the animals' jaws in an effort to rid themselves of thick mucus. Many others, however, hold a different view from Dickson. Fischer[10] says that, in the majority of patients, there is an increase rather than a decrease in the salivary secretion. Geiger[11] says that inhibition of secretions is the rule, but that salivation has been reported and is usually seen in the forage poisoning in horses. Graham and Erickson[12] say that dogs show salivation and lacrimation, and Hall and Davis[13] say that their guinea-pigs often showed a dribbling salivation.

In our experiments on dogs, we have paid particular attention to this phase of the toxin action, and in general feel that it is safe to say that the more acute the progress of the intoxication, the more marked the salivation appears to be. It is not, as Dickson says, the result of champing of the jaws. Many times dogs will be sitting quietly except for the panting; the mouth open, the tongue hanging out, and saliva dripping from the tongue or lower lip. The salivation tends to lessen toward the end of the intoxication, but there is considerable variation in this respect, as some dogs are salivated to the end. It is likewise true that animals which have been kept alive by artificial respiration practically never show salivation on the table; their mouths are usually dry. There is an increase in secretion early, followed apparently by inhibition later.

We studied the matter further by placing a cannula in the salivary duct and stimulating the cut chorda. In one dog which showed salivation when the experiment was carried out, stimulation of the chorda showed a very active and prompt secretion. It would be hard to say that it differed in any way from normal. The chorda responded to a weak current and there was no evidence of any blocking of impulses.

In another dog, in which the stage of salivation had passed, the experiment was repeated with the same technic. Stimulation of the chorda with a very weak current again caused a prompt and active secretion; but, even with the continuance of stimulation, the secretion rapidly diminished and then stopped. After a short period of rest, renewed stimulation was followed by like results; but, with repeated trials, the period of secretion shortened until the nerve became inactive. Pilocarpin injection was still effective.

We have, then, to do with the same phenomenon in the case of the chorda as we have described earlier in the case of the vagus—that is to say, with a greater or less degree of paralysis, preceded in the chorda by a period of stimulation. The stage of stimulation is clearer in some animals than in others. Apparently, the more acute the poisoning the more evidence there is of stimulation. The paralysis may or may not be complete, exactly as we have found with the vagus. We have not found the slightest evidence of "block" in the case of the chorda. When the chorda ceases to respond to a weak current through exhaustion, an increase in the strength of the current does not help matters.

These findings of a stage of stimulation, followed by one of more or less paralysis of the chorda, will explain completely the various discrepancies and disagreements that appear in the descriptions of both patients and of experimental animals affected with botulism. Either man or animal may show salivation or dry mouth, depending possibly on the acuteness of the attack or on the stage in which the observations are made.

Eye.—There is much the same difference of opinion in regard to the effect of the toxin on the intrinsic muscles of the eye as there is in regard to the salivary secretion just discussed. For instance, Dickson[9] says that there is mydriasis and loss of reflex to light stimulation and that complete loss of accommodation soon follows, and he ascribes these changes[6] to blocking of impulses in the fibers of the oculomotor nerves. McCaskey[14] refers to mydriasis as a symptom in the epidemic that he described. On the other hand, Fischer[10] says that one never observes true mydriasis; there may be strong dilation but no true "stare." He discusses the matter fully, quoting Muller's work especially. Again, Semerau and Noack[15] say that, in contrast to the findings of Fischer and some others, they had observed true mydriasis. Schübel[3] describes pupil widening in frogs, pigeons and cats after injection of botulinus toxin, but could not get any effect on the pupil from dropping the toxin in the eye.

Our own observations were made mainly on dogs, although we have noted the pupil widening in other animals, and in pigeons. Early in the course of the poisoning in dogs, when respiratory difficulty may be first manifest, and there is some incoordination in the hind legs, there may be little or no apparent departure from the normal in the size of the pupil. Later, the pupil dilates widely and the animal seeks to protect itself from the light by crawling into dark corners. Physostigmin dropped into an eye, with the pupil so dilated, will produce a complete myosis. The pupil will also react well to light stimulation, although the impression is made that when an electric light, for example, is flashed into the eye the contraction is not so complete as it normally would be.

Later in the course of the poisoning and even after an animal's normal respiration has stopped and it has been kept alive by artificial means for twenty-four hours, the pupil, which is always widely dilated, will usually react to strong light stimuli; but here again the reaction is not entirely satisfactory. Still later, possibly after two or three days, the pupil is found widely dilated and practically immobile.

The trouble is evidently along the course of the fibers of the oculomotor nerve and not with the cervical sympathetic nerve. In one dog, we removed the outer wall of the orbit and the orbital fat, and by means of fine forceps rotated the eye inward so that electrodes could be applied at the region where the optic nerve enters, accompanied by the ciliary fibers. A minimum strength of current caused a prompt contraction of the iris; but, here again, the reaction was not so complete nor so well maintained as it should have been. Even with continued stimulation, some relaxation slowly

9. Dickson: Monograph 8, Rockefeller Inst. M. Res., 1918, p. 43.
10. Fischer: Ztschr. f. klin. Med. **59**: 58, 1906.
11. Geiger, J. C.: South. M. J. **16**: 106 (Feb.) 1923.
12. Graham and Erickson: J. Infect. Dis. **31**: 402, 1922.
13. Hall, I. C., and Davis, M. C.: J. Exper. Med. **37**: 585 (April) 1923.
14. McCaskey, G. W.: Am. J. M. Sc. **158**: 57 (July 19) 1919.
15. Semerau and Noack: Ztschr. f. klin. Med. **88**: 304, 1919.

appeared. The cervical sympathetic nerve was also isolated and stimulated, resulting in a very prompt and satisfactory response—marked exophthalmos and extreme dilatation of the iris. The cause of the mydriasis is therefore, as in the case of the salivary gland, with the parasympathetic innervation, a greater or less degree of paralysis of the endings of the fibers of the third nerve. Whether there is a stage of stimulation, as with the chorda, we cannot say; but certainly that is not improbable.

These findings will explain the discrepancies in the various reports that have been cited above. If mydriasis is simply a widening of the pupil, then it is always present. True paralysis of the iris, with complete immobility of the pupil is probably usually not present in human botulism, but it is certainly possible. There is the same variation in degree of severity of action here as in the nerves elsewhere.

It is common to find lacrimation also, in cases in which the salivation is marked. In such dogs the skin around the eyes is found quite wet where the tears have flowed from the eye. On the other hand, if the poisoning is not acute, the nasal duct will doubtless care for the small increase in tear secretion.

Still later there is probably the same interference with the nervous mechanism of the lacrimal gland as with the secretory nerve to the salivary gland. Dogs that have been kept alive for twenty-four or forty-eight hours usually show some corneal changes, desquamation, and later, opacities, in spite of efforts to maintain a good condition of the eye by frequent washing with salt solution. Several factors are doubtless responsible for the corneal changes; among them may be mentioned the unwonted position of the animal, preventing the natural flow of tears over the eye, and the lack of winking reflex; but, in addition, close observation shows an unusually dry condition of the eye. There is evidence, therefore, for believing that there is a stage of stimulation followed by a greater or less degree of paralysis of the secretory nerve of the lacrimal gland.

VAGUS NERVE

As to the condition of the vagus, it is unnecessary to go into detail, as it was discussed in the earlier paper, where it was pointed out that varying degrees of loss of activity were encountered, even up to total paralysis. We have confirmed these statements during the last year. Whether the vagus first undergoes stimulation is harder to answer, but it is not improbable, as some authorities speak of the slow pulse seen early in the intoxication. Dickson [9] says that the early authorities emphasized the fact that the pulse rate was extremely slow, and compared it with the pulse rate of digitalis poisoning. Also that Senekpiehl had noted at the onset of the intoxication a pulse rate of from 50 to 60. These facts would seem to point to an early stimulation of the vagus but to show that later this period of stimulation passes off and is replaced by lessened vagus control, with a resulting acceleration of the heart. Fischer says that the period of slowing was not seen in any of his cases, but that later, through "vagus paralysis," an increase of pulse rate appeared, even to 150.

The evidence, then, is that the vagus, in common with the oculomotor and chorda tympani nerves, probably undergoes some stimulation before the stage of partial or complete paralysis appears.

COMMENT

In the physiologic studies reported in the earlier paper, and also given here, there would seem to be found an adequate explanation for the symptoms of human or animal cases of botulism, but, in order to make this clear, it is necessary to go into the matter more closely and to try to correlate the findings and their interpretation with those reported by other workers. As to the cause of the symptoms of the intoxication, there are the two main views; one, that the action is on the central nervous system, either thrombosis of the cerebral vessels or an action on the motor nuclei; and the other, that the symptoms are peripheral in origin. It is not necessary to discuss the former view in detail, as it has been covered fully in many papers on the subject, including our own paper published in 1923. The fact that the views held by different workers are contradictory and are many times inadequate need not be dwelt on further.

For the peripheral point of attack, there is, as stated earlier, the paper by Schübel; but he, too, in addition to the peripheral action, describes extensive pathologic changes in the central nervous system of frogs. He concludes that it is possible that the toxin may exhibit a ferment-like action in the nerve cells and that, probably from the normal constituents of the nerve cells, poisonous split products are formed, which act on the motor endings.

It is hard to see why it is necessary to go to such lengths to explain the peripheral action of the toxin. There is no reason to believe that the toxin itself may not be responsible for these changes. The extensive degenerative changes described by Schübel as occurring in the spinal cord of frogs have not been found in warm blooded animals, and yet the curare-like action is found in them just as in the frogs, and it even appears in them much earlier than in the cold blooded animals.

In respect to the action of the toxin on the motor nerves, the points of view of Dickson and Shevky and of ourselves would seem to be much alike, the main difference being merely one of interpretation. We agree that there is no organic destruction of tissue; but, according to the view held in this laboratory, there is a greater or less degree of paralysis of the motor nerve endings, while, according to Dickson and Shevky, the endings (or myoneural junctions) show a marked susceptibility to fatigue. But Dickson is naturally constrained to inquire as to the cause of the fatigue. The effect is seen in frogs sitting quietly in tanks, in pigeons, guinea-pigs, cats and dogs confined in small cages and therefore not subject to the ordinary causes of fatigue. The paralysis will progress when the animals are under morphin, but its course is delayed in such cases as we have described.

It is stated against our view of a curare-like action that the effect is not "typical." This is perhaps a matter of words. According to our view, it is typical but not complete, just as the curare-like action of atropin in frogs is typical but not complete. But is it not true that the difference in the point of view is merely one of interpretation? Is not the "fatigue" of Dickson and Shevky the incomplete curare action we have described? The curare action in its early stages is universally recognized as appearing with the same symptoms as physiologic fatigue. As Cushny [16] says in his discussion of curare, "Here, perhaps better than elsewhere, it can be shown that the condition of paralysis produced by poisons is analogous to that termed by physiologists 'fatigue.'" And again he says: "The paralysis of the nerve terminations by curare then is of the same nature as physiological fatigue." Also

16. Cushny: Textbook of Pharmacology and Experimental Therapeutics, 1924, p. 306.

Schmiedeberg,[17] in his discussion of the action of curare, says, "With incomplete paralysis of the nerve endings, the nervous apparatus fatigues with electrical stimulus more easily than in the normal condition." So also Sollmann[18] says of the development of the curare paralysis that "fatigue sets in more readily than usual." These quotations illustrate sufficiently the generally accepted views of the resemblance of these two phenomena, realizing meanwhile that the fundamental causes underlying the two manifestations may be quite different. As has been suggested, in one case the connecting mechanism may be present, but prevented in some way from acting, while in fatigue the same mechanism is probably exhausted from overstimulation. We believe, therefore, that the botulinus "fatigue" is merely another name for botulinus "paralysis."

In the parasympathetic system, the difficulty of adjusting the two points of view is greater. On the one hand, it is said that the trouble is a block in the conducting nerve mechanism, which block can be broken down by a stronger electric current. According to our findings, the condition is essentially the same as with the motor nerve ends; viz., a greater or less degree of paralysis of the parasympathetic nerve endings. We have at times demonstrated the paralysis to be complete in the case of the vagus and to be almost complete in the motor oculi and chorda. In the case of these nerves, there has been no block, the response was prompt but not sustained, and increased strength of stimulus made matters worse by increasing the "fatigue" symptoms and perhaps turning a feebly active vagus into one fully paralyzed.

Whether the parasympathetics are stimulated before paralysis is harder to answer. Certainly it is the case with the chorda, possibly with the motor oculi, and probably with the vagus.

EXPERIMENTS ON THE TREATMENT OF BOTULISM IN DOGS

In the earlier paper from this laboratory, it was pointed out that since the cause of death in dogs was failure of the respiration due to peripheral causes and not to failure of the circulation, it might be possible to maintain life by artificial respiration until such time as the nerve ends had recovered sufficiently to carry on their normal function. With this object in view, we have been keeping dogs alive by artificial means, placing a cannula in the trachea as soon as the respiratory movements have ceased. The cannula was connected with bellows which were operated by an electric motor, the air being warmed by passing through a heating chamber. Within a few moments after respiration was started, the animal's color improved and it regained consciousness, as evidenced by its response when spoken to. On account of this fact, it was necessary to give the animal a narcotic to keep it quiet and to make it comfortable. For this purpose, we found that morphin gave best results, although we used paraldehyd at times. Care was taken to keep the animals in as good condition as possible while they were being kept alive. Fluid was supplied at regular intervals, usually 250 c.c. being given by stomach tube three or four times a day. At times, warmed Ringer's solution was injected intravenously or given into the peritoneal cavity. Some of the animals were given milk by stomach tube in place of water when they had been kept alive two or three days. We also gave dextrose dissolved in the water, in these ways trying to keep up the animal's nutrition and avoid acidosis. The bladder was emptied twice daily and the animal's skin was kept clean and dry, the animal being raised from the table on a rack so as to allow the air to circulate under it. The room was kept quite warm, and in cool weather and at night the animals were kept covered and electric lights were placed above to maintain body heat.

Artificial Respiration.—In the first series of dogs, therefore, we tried the effect of maintaining life by artificial respiration alone, in order to give the nerve ends time to recover. In the length of time which we kept these dogs alive, namely, two or three days, we were not successful in attaining our ends. Perhaps it might be accomplished if the dose of toxin was not excessive; but in such experimental work, utilizing different lots of toxin, the dosage was bound to be uncertain. Failure was doubtless due to the fact that the toxin was retained in the blood for a long time. It is apparently destroyed or neutralized quite slowly. For instance, we withdrew 2 c.c. of blood from a dog three days after normal respiration had ceased and artificial respiration had been substituted. Injections of such blood into guinea-pigs always caused death within twenty-four hours. In this connection, it might be mentioned that Brüger says that the injection into guinea-pigs of serum from patients, even three weeks after they have recovered from an acute attack, will call forth the disease in the guinea-pigs.

If the toxin is not destroyed or neutralized easily, it is not secreted in the urine in appreciable amounts, so far as we can judge from the intraperitoneal injection of urine of these dogs into guinea-pigs. We have repeatedly injected amounts as large as 5 c.c. and have never seen any symptoms of the botulism develop from it. These results are in sharp contradistinction to those of Schübel, working with frogs. He found that the urine of one frog was toxic to the second, and the urine from the second frog produced the disease in the third. These results would seem to indicate a difference between warm and cold blooded animals in their mode of disposing of the toxin.

Physostigmin.—Before leaving this phase of the work, we tried the effect of physostigmin on the dogs. In some of the animals which we kept alive, we injected the alkaloid in doses of from 0.3 to 0.5 mg. every four to six hours, but we never saw any favorable results from its use. In another dog, which, on account of a severe infection, we were going to kill, we tried the effect of the intravenous injection of larger amounts. Test of the sciatic nerve showed that its action was almost entirely gone; a slight movement in the foot muscles was all that resulted from the nerve stimulation. Physostigmin was now injected in 5 mg. doses, and the nerve tested after each injection. No increase in the strength of the movements of the foot could be noticed even after a total of 100 mg. had been given. It would not seem, then, that this alkaloid has any antagonistic action against the peripheral action of the toxin.

Antitoxin.—As the dogs were not disposing easily of the toxin in the blood, we next tried the effect of the use of antitoxin[19] in addition to artificial respiration. In order to make the test more severe, we allowed the intoxication to proceed until respiration had ceased before the antitoxin was injected intravenously. The animals were then cared for as described above.

17. Schmiedeberg: Grundriss der Pharmakologie, 1906, p. 104.
18. Sollmann: Textbook of Pharmacology, 1922, p. 382.

19. Antitoxin was supplied by the Bureau of Animal Industry of the U. S. Dept. of Agriculture and by Prof. Robert Graham of the University of Illinois.

The results were in general much more encouraging than with artificial respiration alone. For instance, the blood became nontoxic. In several dogs from which blood was taken immediately after artificial respiration was commenced, the condition of the blood was such that the guinea-pigs to which it was given died within twelve hours, while blood drawn from six to twelve hours after the antitoxin had been given proved nontoxic. We tried to find out just when the blood became nontoxic by withdrawing it at two-hour intervals and injecting it into guinea-pigs, but did not have much success, as the reaction of the guinea-pigs was very irregular.

As is well known in outbreaks of botulism, the use of antitoxin in patients has not clearly demonstrated its value. It apparently will protect, but if not given until after the disease is clinically discernible, it has not proved efficient. In the light of our work, the reason for this failure is clearly to be seen. Even after the blood is rendered nontoxic by the use of antitoxin, the nerve ends must recover sufficiently to perform their normal function. If the paralyzing effect of the toxin has been carried to a considerable degree, death is bound to occur before the endings of the nerves in the respiratory muscles have recovered. It is in this interim, therefore, that artificial respiration should prove of value and probably life-saving. We have carried out this procedure in numerous dogs and, while it is true that we have never brought an animal through to complete recovery, on the other hand, neither have we lost a single animal from botulism. They have all died of the various accidents that have been described above. It is unnecessary to go into details of the clinical histories of the different animals, but there may well be given a short discussion of some of the later animals which showed our greatest degree of success.

We have frequently kept dogs alive for three days, and in some cases for practically four full days after their normal respiration has stopped. It must be remembered that it was thought necessary to keep them more or less under morphin all the time in order to relieve pain and discomfort; but the very fact that morphin was used would prevent the dog when it was released from getting up and moving about, to say nothing of the unwonted position which it had maintained for from ninety to 100 hours. To what extent the morphin would interfere with the restoration of respiration it is impossible to say. It is true that, in several cases in which the animals had been kept alive for forty-eight hours, more or less, and the artificial respiration was removed for a time, the animal would, after a minute or so, struggle somewhat, but apparently make no well sustained effort to breathe. In other dogs, following the removal of the artificial respiration, the animal started to breathe and apparently got along fairly well for a short time, but was not able to maintain itself permanently, and artificial means had to be resorted to again. In one of the cases in which the greatest success was attained, the animal had been kept in good condition for almost four full days. When allowed to do so, it started to breathe normally, except for the fact that the movements were labored. The animal was released; it turned over, but naturally was not able to stand. It held its head up well and even managed to get a muzzle off which had been placed on it. The breathing still being labored, artificial means were again instituted, the belief being that the nerve endings had not completely recovered. In this we were doubtless wrong, as the animal was found dead half an hour later. An examination showed that the tracheal tube was entirely closed except for a pin point opening, and the animal had died of suffocation in spite of the fact that the tube had been cleaned an hour or two earlier. Such a result, in spite of its unfortunate outcome, was indeed practically a success. The labored respiration was due to tracheal obstruction and not to paralyzed nerve ends, and it can hardly be doubted that, had the patient been a human being capable of cooperation instead of a dog which had to be restrained, the treatment would have been a complete success. The time element is of utmost importance, but how long it takes for the ends to recover no one can say—probably not as long as we have given our dogs. With a human being, it would be possible with a word to test the patient's capacity to breathe, but this is not the case with dogs. With them in such a condition, it is the opposite of cooperation that is encountered.

From one dog, we did get some light as to the time of recovery of the nerve endings after the injection of antitoxin. This animal had shown early loss of action of the diaphragm, and later very complete muscular relaxation with very little attempt at movement. After artificial respiration had been carried on for two days, it was decided that it would not be advisable to try to continue the experiment, as the animal showed a very marked infection in its head. Respiration was stopped, and as soon as the heart had ceased, an examination was made as to the condition of some of the peripheral nerves. The sciatic showed only very slight activity, a slight movement in the leg and just a perceptible movement in the toes. There was still, therefore, almost total paralysis. With the phrenics it was otherwise. Stimulation of these nerves brought out a prompt and fairly satisfactory contraction of the diaphragm, but the contraction was not well sustained, as slow relaxation would appear even with continued stimulation. Repeated stimuli were given, but the response finally lessened and, after a few more stimuli, the nerves became inactive. In this animal, there was apparently a very considerable degree of recovery of the phrenic endings; but as to how effective they would have been in supplying the needs of respiration, it is impossible to say.

In another series of experiments, we varied the treatment by giving the antitoxin earlier in the course of the intoxication. As soon as the respiration became so seriously involved that it was apparent that death was a matter of a very few hours, we injected 10 c.c. of antitoxin intravenously. Artificial respiration was given as needed, and in every other way the dogs were treated as described above. We shall give the details of only one experiment; namely, that of the dog which showed the greatest degree of improvement under this modified form of treatment. The respiration showing marked involvement twenty-eight hours after the toxin had been injected, the antitoxin was given, and late that night artificial respiration was instituted. The next morning the animal was found to be making some respiratory movements, and in the afternoon the artificial respiration was stopped. As normal breathing seemed adequate, the animal was released. As a result of the morphin and the unnatural position its movements were clumsy, but in spite of that it was able to walk fairly satisfactorily about the laboratory. As the respiration for some hours had been found to be adequate, the tracheal cannula was removed and the wound in the neck closed. In order to keep the animal quiet and comfortable, 30 mg. of morphin was given at 5 p. m., and it was placed in a cage. At 7 p. m. it

was found breathing normally, but at 9 p. m. it was dead. It is impossible to say what killed it after it had breathed naturally for seven hours, and it can only be suggested that it was the morphin. While the dose was not large, it might have been too great for a dog in so weakened a condition. It was observed that the animal was tremendously prostrated by the drug, and this is the most reasonable cause to assign to its death. It is significant, however, that in this dog which followed, so far as treatment is concerned, a human case, the greatest degree of success was reached.

METHODS OF PROLONGING LIFE

An interesting paper concerned with the treatment of botulinus intoxication is contributed by Bronfenbrenner and Weiss.[20] They report that they were able to prolong the life of guinea-pigs which had been injected with toxin by etherization, by the administration of phenobarbital (luminal) sodium and by morphin given subcutaneously. This prolongation of life was sufficient in certain cases to make the use of antitoxin effective.

ACTION ON THE CENTRAL NERVOUS SYSTEM

Finally, we want to make it clear that, in putting forward the peripheral nervous system as a seat of action of the botulinus toxin, we do not wish to be understood as denying the possibility of an action on the central nervous system. We do feel, however, that up to this time no such evidence has been presented that will stand a critical investigation. Some of the difficulties connected with accepting the various views that have been put forth have been discussed earlier.

In the course of our experiments, we have removed the brains of many of the animals that have died from the effect of the toxin, and they have been examined by Prof. A. M. Barrett of the State Psychopathic Hospital, who will make a fuller report on them at a later time. For the present purpose, a brief report may be given. These brains were all removed immediately after the death of the animal and were placed in 96 per cent. alcohol, which was changed every few days until the brains were well hardened.

Dr. Barrett reports that the earlier brains which he examined, which were removed from animals immediately after the animal had stopped breathing, and in which no effort was made to prolong life, showed absolutely no change in the cells of the motor nuclei or in the cells of the cortex.

In animals that had been kept alive for a time by artificial respiration, there was also no change in the motor nuclei; but there was a change in the cortical cells, which in certain cases showed rather profound disintegration. These cortical changes, Dr. Barrett considers, are not in any way characteristic of botulism, but are similar in character to those seen in many other types of intoxication. The important matter is that, in all cases, the cells of the motor nuclei are normal in appearance and that, in the earlier brains which would show an uncomplicated botulinus picture, the results are negative. Only in the later cases, in which complications arose, such as marked infections, were there the changes in the cortical cells. These changes coincided with the clinical symptoms of the dogs which, after a period of two or three days of artificial respiration, showed symptoms of unconsciousness and a profound intoxication very different from the symptoms of botulism.

20. Bronfenbrenner and Weiss: J. Exper. Med. **39**: 517, 1924.

CONCLUSION

All the essential symptoms of botulism can be explained by an incomplete curare-like paralysis of the endings of the motor nerves to the voluntary muscles, including the diaphragm, and by a more or less complete paralysis of the parasympathetic nerve endings. The paralysis of the parasympathetics is preceded by a stage of stimulation.

The administration of morphin will delay the course of the intoxication, allowing a longer time for antitoxin to exert its effects. Additional time may be secured, if necessary, by the use of artificial respiration. It is very important that antitoxin be administered as early in the course of the disease as is possible.

ABSTRACT OF DISCUSSION

DR. J. C. GEIGER, Chicago: The problem of botulism has necessarily two aspects. The part of the problem that is of interest to public health agencies is now well understood. The clinical part, however, has many features about which our knowledge is yet obscure or very meager. Botulism is a rare disease in the United States. The outbreaks that have occurred have averaged about fifteen each year. One hundred and thirty-four outbreaks have been reported, with 458 cases and 309 deaths, a mortality of 65 per cent. plus. Ninety-eight per cent. of the outbreaks occur in western states whose soils show considerable contamination with the spore of *B. botulinus*, or from products canned in the West. Any method of preservation of food in western states should always contemplate the use of the pressure apparatus. I have made numerous tests to determine the presence of toxin in the blood serum in cases of botulism, both in the early and in later stages of the disease. All have been negative. The isolation of the spore from the stools or agglutination reactions with blood serum have yielded the best results in the laboratory tests performed. The observation in this paper that physostigmin has no antagonistic action against the peripheral action of the toxin in dogs, and, therefore, is of probably no curative effect if administered in human cases of botulism, was interesting in the light of the author's previous observations and announcements. As there seems to be some fixation of the toxin in the body and probably no increase after the poisonous food has been ingested, early administration of the antitoxin is desirable. This is very difficult of application, as usually the disease is not recognized within forty-eight hours after the food has been consumed, and this is not unlikely to be the time limit of the efficiency of the antitoxin. In this connection, it is well to mention that Type A is by far the most predominant type demonstrable as causing the outbreaks in the United States. Type B is exceedingly rare as a cause of the disease in man, and an outbreak from the so-called Type C is, so far, unknown in the United States.

PROF. A. J. CARLSON, Chicago: In the course of our studies we have observed very many rats, guinea-pigs, rabbits and six dogs dying from B. toxin. I am quite familiar with the symptoms of curare poisoning in mammals. As Dr. Edmunds has pointed out, in animals the curare acts very quickly, and there is a corresponding quick recovery if artificial respiration is carried out. The dog is not a very good subject for this kind of work, being extremely resistant to B. toxin. We had to give dogs by mouth from 50 to 80 c.c., of a toxin fatal to mice in a dilution of 1: 100,000. We have had dogs recover from a dose of 80 c.c. B. toxin by mouth. I feel certain that B. toxin in mammals injures many organs besides the motor nerve endings. I should think that Dr. Edmunds' therapy, even if correct in theory (peripheral paralysis), would be quite uncertain and possibly dangerous in practice, for the reason that one probably would have to perform tracheotomy on the patient. We could not carry on artificial respiration as we do in the dog. This would probably bring on pneumonia. We frequently see pneumonia in a B. poisoned mammal that lingers for a week or ten days before it dies. When we have given

this disease to monkeys and carry them through a fatal dose over from three to five days with artificial respiration, then we would have some real basis for this type of human therapy. Or one should do this in guinea-pigs or rabbits—they are closer to man so far as sensitiveness to B. toxin is concerned.

DR. C. W. EDMUNDS, Ann Arbor, Mich.: I took a number of these animals that died of the toxin, removed the brains, and sent them to the psychopathic hospital, where they were examined very carefully by Dr. Barrett. He was unable to demonstrate in any of the motor nuclei the slightest change from normal. In the animals kept alive for three or four days, there was a change in the cortical cells. The doses of toxin were never given by mouth; we always injected them intraperitoneally—about 3 c.c.—if the toxin was strong, otherwise more. It was fatal in every case. By injection into the peritoneal cavity one can get the symptoms of intoxication within twelve hours, and we always worked with doses that would surely prove fatal. In man it would certainly be necessary to perform a tracheotomy in order to carry on artificial respiration for any length of time. I do not believe that there is an apparatus on the market today which would be suitable for this purpose without tracheotomy. As a matter of fact, this method of carrying on artificial respiration has already been tried successfully in a case of diphtheria that occurred in St. Louis. In this case, when the diphtheritic paralysis appeared a trachael tube was inserted and respiration maintained by artificial means for three days, when the child recovered.

REGENERATION OF THE PANCREAS FROM THE PANCREATIC DUCT *

N. F. FISHER, PH.D.
Assistant Professor of Physiology, Baylor University College of Medicine
DALLAS, TEXAS

In my use of the word regeneration, I shall mean the growth of new pancreas tissue from the pancreas duct remnants. These experiments were suggested by the regeneration of pancreas tissue from the pancreatic duct stump in totally depancreatized dogs kept alive with insulin. Suffice it to say here that more than 0.5 gm. of normal pancreas tissue regenerated in the course of eight months, at the end of which time the animal was killed. The finding seemed of sufficient importance to test (*a*) the capacity of the duct to regenerate new pancreas tissue in situ and (*b*) when transferred to other parts of the body.

The method used was as follows: Pups about 8 weeks of age were selected, the assumption being that young duct tissue possessed a greater capacity for regeneration of pancreas tissue. All the pancreas in each dog was removed except a portion of the tail. Special care was exercised in removing every bit of the organ from the region of the main duct. In some cases, the duct was left intact, while in others it was doubly ligated as far as 2 inches from the duodenum and cut between the ligatures.

For the transplantation experiments, pieces of pancreatic duct about one-fourth inch in length were taken from pups several days old and transferred to hosts 10 weeks of age. The transplanted tissue was allowed to remain from forty to sixty days and then removed and submitted to microscopic examination.

REPORT OF EXPERIMENTS

EXPERIMENT 1.—Three fourths of the head portion of the pancreas was removed in a male dog, aged 10 weeks, December 4, and all apparent pancreas tissue was carefully separated from the main duct for a distance of 2 inches from the duodenum. The duct was doubly ligated and cut between the ligatures. January 19, forty-six days after the operation, the pup was killed.

At necropsy it was found that the old pancreatic duct stump had degenerated. A new duct grew from the base of the old duct to the pancreas 2 inches distant, and established functional union.

EXPERIMENTS 2 and 3.—Three fourths of the pancreas was removed in two male dogs of the same litter, aged 8 weeks, November 8. The main duct was isolated, ligated and cut as in the case of Dog 1. December 2, Dog 2 was killed by other dogs, twenty-four days after the operation. Dog 3 was chloroformed, January 18, seventy-two days after the operation.

At necropsy it was found that the proximal and peripheral portions of the main duct in Dog 3 had suffered no apparent change. From the peripheral portion of the main duct, several new branches had formed. One branch grew from the peripheral portion of the duct to the pyloric end of the stomach, about 4 inches distant. Injection with methylene blue, and histologic sections, proved that physiologic union had been established. From the proximal portion of the main duct, several ducts grew to the pancreas. From the base of the main duct, two new ducts developed; one duct joined the pancreas, 2 inches away; the other duct extended about 1 inch in the opposite direction. On the end of the latter duct was a piece of regenerated normal pancreas tissue 5 mm. in diameter.

Necropsy on Dog 2 showed that the main duct, which had been separated from the pancreas, had suffered no apparent change. From the base of the duct stump, a new duct formed connection with the pancreas, 2 inches away.

EXPERIMENTS 4 and 5.—March 14, three fourths of the pancreas of two female pups of the same litter, aged about 8 weeks, was removed. No pancreas tissue was left within 2 inches of the base of the duct. The main duct was left intact. Both pups were killed, May 14, two months after the operation.

Necropsy on Dog 4 showed that from the base of the main duct there had developed a new duct, about one-fourth inch long, supporting regenerated pancreas tissue. The fresh tissue weighed 55 mg., and consisted of islet and acinous tissue.

In Dog 5 there were no signs of new ducts being formed, or any indications of regeneration of pancreas tissue from the duct stump.

EXPERIMENT 6.—The entire pancreas was removed in a female dog, aged about 1 year, weighing 32 pounds (14.5 kg.), except a small piece of the body of the gland, which was purposely left behind. The pancreatic ducts were ligated with linen thread very close to the duodenum, and special precautions were taken to remove every apparent trace of pancreas tissue from the vicinity of the ducts. Two days later, the dog had fully recovered from the operation. For the next two months, daily urine examinations were made. The amount of sugar present varied between 0.1 and 0.3 per cent. During the next two months, the dog was allowed to run at large. No change was noted in the animal's condition. The animal was killed 138 days after the operation.

At necropsy, the urine in the bladder contained 1.5 per cent. of sugar. The piece of pancreas left at the operation had increased to 311 mg. On the duct, was the linen thread marking the place of ligation. The main duct stump beneath the serosa of the duodenum had regenerated 934 mg. of pancreas tissue. The weight of the newly formed duct was 125 mg.

EXPERIMENTS 7 and 8.—One-fourth inch of pancreatic duct was transplanted subcutaneously, December 6, beneath the abdomen of two female pups of the same litter, aged about 8 weeks. The duct tissue was taken from pups, aged 2 weeks. The grafts were recovered, February 1, fifty-six days later. Both pieces had almost doubled in size.

EXPERIMENT 9.—A piece of pancreatic duct one-half inch long was transplanted subcutaneously beneath the abdomen of a male pup, aged 10 weeks, January 7. The duct segment was taken from a pup, aged 4 days. The graft was recovered, February 16, forty days later. There was a marked proliferation of ducts from the transplanted tissue.

* Read before the Section on Pathology and Physiology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

COMMENTS

From the foregoing experiments, it is very evident that there is a great tendency toward the proliferation of new duct tissue. In almost every case, when the pancreas was removed from the base of the duct, new ducts were formed to establish functional union between the pancreas and the duodenum. The difficulty of occluding the main duct by mere ligation has been mentioned by many workers. Clark described the formation of a new opening into the intestine for the pancreatic secretion, in the rabbit, after the duct had been doubly ligated and cut between the ligatures. The ability to reestablish connection between the intestine and pancreas is especially emphasized in the case of Dog 3, in which a new duct grew from the peripheral end of the main duct to the stomach 4 inches distant. When methylene blue was injected into the duct, it poured into the stomach, proving that functional union had been effected. In the cases in which new ducts grew from the base of the old duct and joined the pancreas, we could be certain only that new duct tissue was formed, but could not prove that pancreas tissue had regenerated. This formation of new ducts confirms and extends the results of previous workers with regard to the capacity of the pancreatic duct to form new duct tissue.

It was only in the cases of Dogs 3 and 4 that the regeneration of new pancreas tissue was clearly demonstrated. In these two cases, a new duct grew from the base of the old duct, away from the pancreas remnant, and at its end supported normal pancreas tissue. The regenerated pancreas was more than 2 inches removed from the pancreas tissue left at the time of operation. It should be mentioned that regeneration of pancreas tissue does not occur in every instance when the pancreas is separated from the main duct. In one case, the duct was considerably thickened, which indicated trauma to the duct. In another case, more pancreas regenerated from the duct from which all pancreas had been previously removed than resulted by hyperthophy from a piece left at the other duct. This suggests that regeneration may be more rapid than hypertrophy when proper conditions are provided. However, in spite of the regeneration of pancreas tissue in Dog 6, there was a marked lowering of the carbohydrate tolerance. The pancreas tissue in the latter case has not been examined microscopically. In the other cases mentioned above, Bensley was satisfied that the tissue was regenerated pancreas.

CONCLUSIONS

1. When the pancreatic ducts are ligated and cut in the dog, there is a marked tendency toward the formation of new ducts to establish functional union.
2. The separation of the pancreas from the base of the main duct leads to the regeneration of new pancreas tissue.
3. Pancreatic duct tissue transplanted to other parts of the body of the same animal or other animals of the same species will proliferate new duct tissue.

ABSTRACT OF DISCUSSION

PROF. A. J. CARLSON, Chicago: Dr. Fisher started this problem two years ago at the University of Chicago. We secured regeneration of pancreas tissue from the stump of the pancreatic ducts in two pancreatectomized dogs kept for a long time on insulin. The problem is that of the ultimate control of diabetes. We have evidence that insulin, in the absence of the pancreas, will not keep the animal alive indefinitely. But, in the absence of the pancreas, there may still be a chance for a regeneration of the pancreas from a transplanted duct. We have succeeded in getting transplanted ducts to grow and live, but the transplanted duct has so far not regenerated the pancreas.

DR. H. R. WAHL, Rosedale, Kan.: What was the relation of acini to the regeneration of the islands of Langerhans?

DR. NELSON F. FISHER, Dallas, Texas: The regeneration in these three cases showed about an equal amount of acinous tissue to island tissue—possibly more acinous tissue. In these cases, one could not distinguish the acinous tissue from the normal pancreas.

PRIMARY CHANCRE OF THE PALPEBRAL CONJUNCTIVA *

W. P. LING, M.D.
PEKING, CHINA

In spite of the great prevalence of syphilis in China, primary chancre of the conjunctiva is not commonly seen. The case reported here is of especial interest for two reasons: 1. It is a double infection in which the tarsal conjunctiva and the skin of the forehead are simultaneously infected. 2. The diagnosis of the case is not an easy one.

REPORT OF CASE

History.—A man, aged 34, came to the eye clinic of the Peking Union Medical College for treatment, Sept. 12, 1923. The patient remembered having had a lesion on the penis in 1914, which disappeared without local treatment. The patient doubted the cause of the lesion, because no examination was at that time made. Shortly after the appearance of the lesion, he received two injections of arsphenamin. He did not develop any symptoms of secondary syphilis.

About ten days prior to his coming to our clinic, he noticed a small "pimple" on his forehead, a short distance above the left eyebrow on the temporal side. He attributed this to a mosquito bite. Two or three days after the appearance of the "pimple," he felt some discomfort in the left upper lid, as if there were a grain of sand under the lid. He consulted his physician, who on examination discovered a roundish elevation with a sharply defined margin, situated at the junction of the inner and middle third of the upper tarsal conjunctiva. The physician treated the lesion with local applications containing silver, mercury and copper. The treatment, however, was ineffective. The patient was then sent to our clinic. The blood Wassermann reaction, as reported by his physician, was negative. The patient stated that he had not been exposed to venereal infection.

Examination.—The upper lid of the left eye was moderately swollen and red, causing a narrowing of the palpebral fissure. There was a definite, indolent, localized swelling at the junction of the middle and inner third in the midhorizontal line. When the lid was everted, a disk-shaped ulcer with slightly elevated margin was seen at the upper border of the tarsus, about 3 mm. in diameter. It was firmly adherent to the underlying tarsus. The ulcer was brownish red and indurated. The superior fornix and the adjacent bulbar conjunctiva were only slightly injected. On the forehead, about 2 cm. above the left eyebrow, was a sharply defined ulcer which, by its dark color and indolent appearance, suggested syphilitic efflorescence. It was about the size of a ten cent silver coin.

The blood Wassermann test made by our laboratory was negative. Dark field examination and culture also were negative.

Treatment and Course.—September 20 and October 4, the patient received 0.45 and 0.75 gm. of neo-arsphenamin given by his own physician. October 9, the Wassermann reaction was said to be positive. He received eight intravenous injections of neo-arsphenamin (0.75 gm.) and nine intramuscular injections of mercuric salicylate (0.06 gm.) before the second Wassermann test was made, December 7. This Wassermann

* From the department of ophthalmology of the Peking Union Medical College.

reaction was said to be negative. The lesions on the forehead and the conjunctiva were reported healed after the first two injections, and were completely healed after the fourth injection.

Final examination, Jan. 28, 1924, revealed the lesion completely healed. Only a slight superficial scar and a shallow, notchlike defect, were left on the upper border of the tarsus.

COMMENT

The diagnosis of the case was rather difficult for the following reasons:

1. The patient stated that he had not been exposed. In spite of this, syphilis was suspected, not so much because of the lesion on the conjunctiva, but on account of the characteristic ulcer on the forehead.

2. The patient gave a history of previous syphilitic infection in 1914; therefore, it was thought at first that it might be a gumma. Such a diagnosis is not probable on account of the negative Wassermann reaction. Our final conclusion was that the first sore on the penis (1914) was not syphilitic. If it was syphilitic, the syphilis must have been cured. The fact that no spirochetes were found in the lesions does not contradict our diagnosis of primary chancre, because both sores were treated with antiseptics before the dark field examination was made.

However, the subsequent course of the lesion, namely, the rapid healing of the ulcer under the influence of neo-arsphenamin and mercury, helped us to arrive at a definite diagnosis of primary chancre. Furthermore, the fact that the Wassermann reaction was reported by the patient's physician to be positive one month after the appearance of the sores, and that it became negative after two months of vigorous treatment, further confirmed our diagnosis.

According to Maxey,[1] who compiled the literature of eighty-two cases of primary syphilitic lesions of the eye, the occurrence of the lesions in the various parts of the eye was recorded in the order given in the accompanying table.

Order of Occurrence of Lesions

	Number of Cases
1. Conjunctiva:	
Upper palpebral	5
Superior fornix	3
Lower palpebral	3
Inferior fornix	3
Location indefinite	13
Plica and tarsus	1
Bulbar conjunctiva	21
2. Lid:	
Upper	1
Lower	4
Ciliary border	2
Location indefinite	27
3. Canthus	4
4. Location unknown	2

From these statistics, it is evident that chancre of the conjunctiva is more common than chancre of other parts of the eye. This is difficult to explain in view of the fact that the conjunctiva is well protected from external contact. We believe that the saliva of persons affected with mucous patches may possibly get into the eye during such acts as kissing and the like.

Increase of Automobile Deaths Greater than Increase of Automobiles.—The increase in the number of automobiles in use as against the increased number of fatalities is shown by the data secured by the Ohio Public Health Association of Columbus, in a campaign directed against this appalling waste of life. These figures show a percentage increase in automobile fatalities (29) in 1923 over 1922 considerably larger than the percentage increase (24) in the number of automobiles.—*Pub. Health Rep.* **39**:755 (April 11) 1924.

1. Maxey, E. E.: Am. J. Ophth. **1**:13 (Jan.) 1918.

Special Article

THE THERAPEUTIC USE OF DIGITALIS

WITH ESPECIAL REFERENCE TO ITS INTRAVENOUS INJECTION *

G. CANBY ROBINSON, M.D.
NASHVILLE, TENN.
PAUL D. WHITE, M.D.
BOSTON
CARY EGGLESTON, M.D.
AND
ROBERT A. HATCHER, M.D.
NEW YORK

Statement of Council on Pharmacy and Chemistry

The Council has long held that digitalis effects can be obtained satisfactorily in most instances by the oral administration of digitalis itself, the tincture or the infusion, and that the intravenous administration of digitalis preparations is rarely necessary. However, investigation indicates that digitalis preparations are administered intravenously far more frequently than seems to be demanded.

Because of the importance of digitalis therapy, the Council decided to appoint a committee composed of men who have made a study of questions concerning the administration of digitalis, and to request this committee to prepare a report for publication which would set forth concisely the limitations of digitalis therapy and the methods of obtaining digitalis effects.

The report of Drs. G. Canby Robinson, Paul D. White, Cary Eggleston and Robert A. Hatcher, which follows, was prepared at the request of the Council. The Council has considered this report and has endorsed its publication.

W. A. PUCKNER, Secretary.

Every physician encounters difficulties in the treatment of cardiac disease, and occasionally he is puzzled by his failure to secure the results described by others. Advantage has been taken of the difficulties attending the therapeutic use of the digitalis bodies to exploit their intravenous administration, and many advantages are claimed for this method which it does not possess. It is not the purpose of this committee to attempt to dictate, but the principles involved in the use of the digitalis bodies will be stated.

The beneficial effects exerted by the digitalis bodies on patients suffering with heart disease result from the changes these drugs produce in the different functions of the circulatory system. The alteration in the functional activity of the heart is in part brought about apparently by their direct action on the contractile and conducting structures of the heart itself, and in part by their indirect action on the nervous structures that control it. The action of the digitalis bodies is not, therefore, altogether simple, even on the normal heart. For an understanding of their effects on the damaged, abnormally functioning heart, careful analysis is necessary, not alone of the several actions these drugs may exert, but also of the various disorders of cardiac function that may lead to heart failure.

In practice, it is often impossible to classify sharply cases of heart failure on the basis of the derangements of function underlying their production. Nearly every case results from a combination of causes, and these must be evaluated relatively to one another in any

* The essential literature relating to digitalis was reviewed recently by G. Canby Robinson (Medicine **1**:1-137 [May] 1922), and further references are omitted here.

attempt to reach a clear understanding by which treatment may be intelligently instituted.

Indeed, the analysis of the disturbances of cardiac function has another important aspect. There are certain disorders of the heart which may lead to cardiac failure and which are only exaggerated by the administration of a drug of the digitalis group. In such conditions, these drugs are definitely harmful and even dangerous. Cases of partial heart-block, and a form of cardiac derangement that occurs in diphtheria may be cited as examples. The careful analysis of the causes of heart failure is especially necessary if one of the digitalis bodies is to be administered intravenously.

It is well, therefore, to protest at the outset of this report against the intravenous use of the digitalis bodies as an emergency measure in cases of sudden heart failure when a careful study of the heart has not been possible. Sudden cardiac failure not infrequently results from a cause, such as coronary occlusion, which may affect the ventricles in such a way as to render them liable to go into a state of fibrillation, which is fatal. At such a time a full dose of one of the digitalis bodies injected intravenously may bring about this unfortunate accident, just as these drugs almost invariably induce ventricular fibrillation when given in fatal doses to mammals experimentally.

Auricular fibrillation is the one condition in which there is general agreement that the digitalis bodies are indicated. This condition is characterized clinically by a totally irregular action of the heart, with a marked acceleration of the ventricular rate and with numerous contractions that fail to produce a palpable pulsation in the radial artery. The efficiency of the heart is greatly impaired by the rapid, irregular ventricular action, and it is because the digitalis bodies are capable of slowing and steadying the ventricular action in a remarkable manner in auricular fibrillation that they have gained much of their reputation in the treatment of cardiac disease. They are, generally speaking, more effective in restoring compensation in young or middle aged patients, in whom auricular fibrillation follows the so-called rheumatic infection, than in older patients in whom arterial sclerosis or chronic myocarditis of syphilitic or of undetermined origin may be responsible for the disordered action of the heart.

Patients with severe symptoms of cardiac failure produced by the rapid and irregular ventricular action of auricular fibrillation are often in urgent need of digitalis, and the question as to the best mode of administration is presented. Rapidity of action may predominate over all other considerations, and may appear to be a definite indication for the intravenous use of the digitalis bodies. In such cases, however, the myocardium may be severely damaged, and its condition may be such that a large intravenous dose of one of the digitalis bodies would be especially prone to set up ventricular fibrillation. There is little danger of this with the oral administration of ordinary doses. Moreover, recent studies have shown that when the major portion of the full calculated amount of digitalis necessary to produce a maximal therapeutic result is given by mouth in a single dose, the drug is often effective in two hours, although in some instances five or six hours is required.

When strophanthin is given intravenously in safe divided doses, only a slight gain may be expected as regards speed of action, although when large doses, which cannot be considered safe, are given the action may be observed in about twenty minutes.

In other disturbances of cardiac mechanism, the digitalis bodies are by no means so clearly indicated as in auricular fibrillation. Members of the group, especially digitalis itself, have proved useful in cases of auricular flutter, the condition in which a so-called "circus movement" becomes established in the auricles, causing them to contract at a rate of about 300 a minute, while the ventricles respond to every second, third, or even fourth auricular contraction. Digitalis affects the heart in these cases in such a way as to favor a change to auricular fibrillation, which is then often replaced by the normal sinus rhythm. With the introduction of quinidin, however, probably a better drug for restoring the normal rhythm has been found. Digitalis is indicated in auricular flutter for another reason. When the ventricular rate is so rapid as to impair the cardiac efficiency, digitalis may bring about ventricular slowing by its power to depress the conducting system between the auricles and ventricles. In this way a degree of partial heart-block may be produced, which allows the ventricles to respond to a smaller proportion of the auricular contractions, and so assume a slower rate. It may be said, therefore, that the digitalis bodies are indicated in auricular flutter when the ventricular rate is excessive, both from the fact that these drugs tend to cause a disappearance of the abnormal auricular activity and because they bring about an improvement in cardiac efficiency by ventricular slowing.

Premature contractions, or extrasystoles, have long been known as one of the early signs of excessive digitalis medication. In spite of this fact, their existence in a patient who has not recently received digitalis should not be taken as a contraindication for the use of these drugs. Under some circumstances, premature beats disappear under digitalis medication. The question of the exact relation of digitalis to extrasystoles (premature beats) is still under discussion. In most cases, extrasystoles are an incident in, rather than a cause of, cardiac decompensation, and their presence may be neglected in considering the probable efficiency of digitalis therapy.

The digitalis bodies have proved of no constant value in paroxysmal tachycardia, although in prolonged attacks, in which evidence of myocardial failure may supervene, digitalis should be used with the hope of improving the cardiac efficiency even without influencing the excessive cardiac rate.

In cases of heart-block, special care and judgment are needed in the use of the digitalis bodies. Depression of conduction is one of the most definite effects that they produce. Therefore, in partial heart-block when further interference with the passage of cardiac impulses from auricles to ventricles may be injurious, the digitalis bodies are contraindicated. In complete heart-block, however, when the ventricular contractions are quite independent of auricular action, the effect of these drugs on the conducting mechanism may be disregarded. There is good evidence that the digitalis bodies, especially strophanthus, may not only seem to improve the efficiency of the ventricles, but also to quicken their rate. Although complete heart-block is not a contraindication for digitalis, the drug should be withheld in cases of temporary heart-block when a return of the normal beat is anticipated. It is under such circumstances that especially sound judgment is needed, and each case represents a problem for study in regard to the use of digitalis and its allies, as all these drugs, with the possible exception of helle-

borein, tend to prevent the recovery of the conducting system and the establishment of the normal cardiac mechanism.

Consideration must now be given to the indications for digitalis bodies in that form of heart disease in which the power of the heart muscle is apparently impaired, and in which no other cause can be discovered to account for the failure of the heart to maintain an adequate circulation. Here it is more difficult to analyze the indications for these drugs, and more dependence must be placed on that uncertain guide, clinical experience. However, competent observers have borne witness to the fact that in myocardial insufficiency, benefit is often derived from the use of digitalis and its allies, though there is no abnormality of rhythm. Improvement in the efficiency of the heart is often seen without any change in rate, and no such change usually occurs in hearts that have the normal cardiac mechanism.

It may be said, without discussing the various theories of their action on the abnormal myocardium, that the fact that these drugs act favorably in cases of myocardial insufficiency gives them a wide application in all forms of heart disease, and warrants their trial whenever a definite contraindication does not exist. For this reason, the use of the digitalis bodies is justified when any symptom or group of symptoms is present which can be accounted for by no other cause than myocardial insufficiency. Dyspnea, chest pain on exertion, orthopnea, edema, cyanosis, congestion of the lung bases, liver or kidneys, with hydrothorax especially of the right pleural cavity alone may be taken as indications for the use of the digitalis bodies, especially when there is evidence of cardiac dilatation, a departure from the usual level of blood pressure and alteration in the character of the heart sounds.

A recent study has shown that definite benefit may be derived from the use of large oral doses of digitalis by patients having so-called chronic myocarditis who show signs of cardiac failure. The drug is especially effective in patients with edema who show no signs of aortic insufficiency. In such cases the results—improvement in symptoms, diuresis, loss of edema and decrease in the size of the liver—may be as impressive as those that occur in patients with auricular fibrillation. In cases with normal rhythm, however, the digitalis bodies are to be used with hope rather than assurance. Each case should be studied with care, as some of these patients are unusually susceptible to the toxic effects of these drugs. It is for this reason that these patients especially should receive digitalis by oral administration rather than by intravenous injection.

The indications for the drugs of the digitalis group are not altered by the presence of a lesion of one or several of the heart valves, except so far as such lesions make it especially desirable to have the myocardium at its best. However, perhaps less is to be expected of these drugs in the presence of aortic insufficiencey than when this lesion is absent.

The presence of pulsus alternans, a phenomenon consisting of alternating relatively strong and weak pulsations of the radial pulse, is a sign of grave myocardial weakness. As it has been observed following large doses of digitalis, its presence has been considered by some to be a contraindication for the use of the drug. Observations on the effect of digitalis in a large series of patients showing this phenomenon have, however, disproved that idea.

THE PROPER METHODS OF ADMISTRATION

Having discussed the conditions in which digitalis bodies are useful and the therapeutic effects which they induce, we will consider the best means of administering them. Obviously, this involves the question of dosage, which, in turn, is based on the activity of the drug, the readiness with which it enters the circulation, and the duration of its action.

Activity.—The United States Pharmacopeia gives directions for standardizing digitalis by means of the frog test. It is not an exact measure of therapeutic activity, but it is the most convenient method available. Other methods of standardization have been employed for special investigations.

Absorbability.—There is an extraordinary difference in the absorbability of the different digitalis bodies, and since they all have very nearly the same kind of action on the heart, it follows that only those which are absorbed fairly uniformly should be administered orally. Squill, apocynum, convallaria, strophanthus and strophanthin are absorbed poorly from the gastro-intestinal tract, but strophanthin may be injected intravenously or intramuscularly when prompt action is imperative. Digitalis is not absorbed from the gastro-intestinal tract with absolute uniformity, but the most active principle— digitoxin or a substance resembling it—is absorbed with a greater approach to uniformity than is any other known digitalis body. The absorption of digitalis is usually nearly complete within two hours after its oral or rectal administration.

Mode of Administration.—When little more than a full therapeutic dose has been absorbed, nausea is induced, and this automatically delays further absorption by closing the pylorus, and vomiting or purgation commonly removes any excess from the gastro-intestinal tract if much more than the full therapeutic dose has been administered, and fatal poisoning is rare after the oral administration of digitalis itself.

Prompt and even dramatic therapeutic effects frequently follow the intravenous injection of a digitalis body in suitable cases, but these are exceptional.

The intravenous injection of digitalis bodies is attended with some danger, because the organism has no means of ridding itself of an overdose administered intravenously, and we do not know in any case just how much will be required to induce the effect imperatively demanded. A digitalis preparation should be used intravenously or intramuscularly only in those cases in which it is imperative that the therapeutic effects shall be induced within two hours or less; that is, within less time than they can be induced with a fair degree of certainty by oral or rectal administration. In the face of such an emergency the risk must be assumed, and it should be minimized by giving the utmost care to the determination of the dose.

Contraindications for Oral Administration.—The only contraindication for oral administration, other than the necessity for haste in inducing the therapeutic effects, is the presence of nausea or vomiting. In such cases, digitalis may be administered by the rectum, and Levy and Wykoff (unpublished data) have found that it is absorbed from the rectum about as rapidly as after oral administration.

Nausea and vomiting are induced by digitalis only after its absorption. They are induced reflexly from the heart itself, and hence are inseparable from the entrance of an overdose of any digitalis body into the circulation, however administered.

It is often asserted that the digitonin present in digitalis irritates the stomach. This is nothing less than a distortion of the facts. There are only traces of digitonin in digitalis, and it would require an amount of digitalis equal to thousands of times the therapeutic dose to yield enough digitonin to irritate the stomach of man.

Digitoxin is by far the most active substance obtained from digitalis, and it is probable that it or a closely related substance is the only principle which contributes materially to the therapeutic effects of digitalis when it is administered orally.

Amorphous strophanthin and crystalline ouabain (so-called crystalline gratus strophanthin) are soluble in water and can be dispensed in ampules of hard glass in which the solution of ouabain remains unchanged for some months; ouabain may be dispensed in ampules in a buffered solution (i. e., one in which sodium phosphate maintains a neutral reaction), which keeps for long periods. Many specimens of soft glass contain enough alkali to destroy ouabain rapidly, and this fact has given rise to the mistaken idea that ouabain is unfit for use in ampules.

Dosage.—It is frequently claimed that intravenous injection has the advantage of absolute precision of dosage. Precision in measuring a dose is commonly confused with precision of dosage. The precise dose of a substance is that which induces a desired effect. It varies with many conditions, so that it is never known for any individual until the effects have been induced in him; and what we generally term the dose of a substance is merely a convenient fraction of the total amount experience has taught us to administer, which is repeated until the desired effects are induced.

The total average dose of fairly active standardized digitalis by the mouth for inducing full therapeutic effects within from thirty-six to forty-eight hours in an adult who has not received digitalis within ten days is about 1.5 gm. of the leaf or 15 c.c. of the tincture. The total dose may be divided into several equal parts given every four or six hours, or one half or one third of the total calculated dose may be given at once, and the remainder in two portions after intervals of four or six hours. If there is doubt about recent medication, smaller doses of from 0.1 to 0.3 gm. of the leaf, or from 1 to 3 c.c. of the tincture should be given three or four times a day, with observation for toxic symptoms or signs on each occasion before the next dose is administered.

Ambulatory adult patients who are seen only at intervals of a week or more may be given 0.1 gm. (1.5 grains) of the leaf or 1 c.c. (15 minims) of the tincture three times a day by the mouth for a week or two, with the warning to reduce this to one dose daily if toxic symptoms appear. Children require somewhat larger doses per kilogram of weight for saturation and maintenance of digitalization than do adults. Rectal dosage may be calculated in the same way as oral, experience having shown that absorption is as rapid after rectal, as after oral, administration.

Intravenous (or intramuscular) dosage of crystalline ouabain or amorphous strophanthin need rarely, if ever, be calculated for saturation. One dose of 0.5 mg as a maximum may be given in the case of an adult; rarely, two or three such doses at intervals of six hours. In an emergency, one dose of 0.5 mg. suffices, digitalis being given by the mouth in doses of 0.3 gm (5 grains) of the powdered leaf or 3 c.c. (45 minims) of the tincture every four hours until the therapeutic effects or signs of toxic action are induced. In case of nausea and vomiting, not the result of digitalization, ouabain or strophanthin may be given intravenously or digitalis by the rectum.

This committee knows of no satisfactory study of the amount of strophanthin or digitalis necessary for saturation by intravenous or intramuscular injection, and of the suitable division into doses and intervals between administration. This subject is in need of careful investigation.

RECOMMENDATIONS

The oral administration of digitalis in the form of the standardized powdered leaf, infusion or tincture, meets every requirement of digitalis therapy, with the exception of those relatively infrequent cases in which immediate relief (within two hours) is imperatively demanded, or when nausea or vomiting precludes the oral method.

When the threatening condition of the patient demands immediate relief and there is no contraindication for the use of digitalis bodies, strophanthin or crystallized ouabain should be injected intramuscularly or intravenously. Great care must be exercised in this method of using any digitalis body in patients who have recently received digitalis or any of its substitutes.

When nausea or vomiting due to causes other than digitalization precludes the oral administration, tincture of digitalis may be administered by the rectum until nausea or vomiting has ceased, after which the digitalis may be administered orally if it is required.

Ouabain may be kept in hard glass ampules or in buffered solution for several months without appreciable change. Physicians should see that pharmacists have available hypodermic tablets containing 0.1 mg., 0.25 mg. and 0.5 mg. (1/650, 1/250, 1/130 grain). These may be dissolved in 1 c.c., 2.5 c.c. or 5 c.c. (15, 40 or 75 minims) of sterile physiologic sodium chlorid solution and injected intravenously or intramuscularly.

The proprietary preparations of digitalis and its principles have no advantage over digitalis, crystalline ouabain and amorphous strophanthin.

Clinical Notes, Suggestions, and New Instruments

A CASE OF NABOTHIAN CYST OF UNUSUAL SIZE*

H. E. HAPPEL, M.D., AND F. P. McNALLEY, M.D., ST. LOUIS

In the literature consulted, the statement is generally made that nabothian cysts of the cervix are small retention cysts, varying from the size of a bird shot to a pea, but no reference to the possibility of their attaining such large size as to be mistaken for any other condition has been found. On this account, we are reporting this case.

REPORT OF CASE

L. O. L., a woman, aged 19, white, referred, Feb. 28, 1922, by Dr. J. Lee Marder, who suspected a cervical pregnancy, had been married three years and had never been pregnant. There was no history of leukorrheal discharge or gonorrheal infection. She began to menstruate at the age of 14 and had been regular until February 1, when the expected period failed to appear. There was a history of "morning sickness," and on two occasions she had observed a few spots of blood on her clothing. Otherwise nothing abnormal had been noticed. Her object in consulting Dr. Marder was to ascertain whether or not she was pregnant.

The general physical examination was negative. Vaginal examination revealed a bluish, globular, cystic tumor, the size

* Read before the St. Louis Medical Society, April 29, 1924.

of a hen's egg, apparently attached by a broad pedicle to the left side of the cervix, completely filling the vault of the vagina. Many large blood vessels were seen traversing the wall of the mass. The tumor was soft, fluctuating and not tender. The uterus was slightly enlarged, anteverted, anteflexed, thickened anteroposteriorly, and freely movable. The adnexa were not palpably enlarged.

Operation was advised and accepted. March 1, 1922, at St. Luke's Hospital, under ether anesthesia, the cyst was excised by an incision made along its attachment to the cervix, which could be made out better under anesthesia. In the final separation of the cyst, a small opening was made into the cavity, and a clear, glairy fluid escaped. The cervix was sutured as in the repair of a unilateral laceration.

Owing to the escape of some of the fluid, there was some shrinkage of the cyst wall, but it was photographed and examined pathologically. Grossly, the specimen consisted of a cyst of 5 cm. in diameter. The external surface, where it had been dissected out, was rough. On section, the wall was seen to be from 2 to 4 mm. in thickness, the cavity being filled with clear mucoid material. The lining was white and perfectly smooth.

Microscopically, the wall of the cyst was seen to be composed of connective tissue containing many widely dilated vessels. It was lined by high columnar epithelium similar to that of the cervical glands. The entire wall, but particularly the outer third, was densely infiltrated with small round cells.

The pathologic diagnosis was: retention cyst of the cervix.

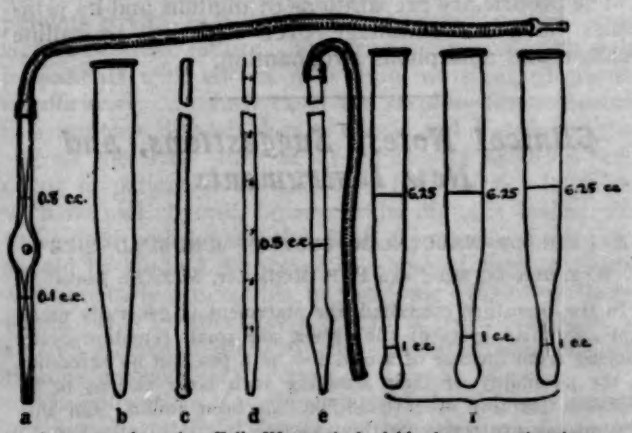
Retention cysts of the cervix are the result of healing of erosions which are almost always caused by endocervicitis. In this case there was no history of such infection, but there had been such a condition in the cervix.

Wall Building.

A BLOOD DILUTING PIPET FOR MICRO-FOLIN-WU METHOD OF BLOOD SUGAR ESTIMATION, USING 0.1 C.C. OF BLOOD: PRELIMINARY REPORT *

T. LUTHER BYRD, M.D., MILWAUKEE

With this pipet, one may make a blood sugar estimation simply and accurately, with the minimum quantity of blood, 3 drops, instead of from 3 to 5 c.c. Therefore, a painful



Apparatus for micro-Folin-Wu method of blood sugar estimation.

venipuncture is avoided, only a pin prick in the finger or ear being necessary. It furnishes also a very simple method of obtaining blood from infants, small children, and obese patients.

The drawing shows my original pipet (*a*) graduated at 0.1 c.c. and 0.8 c.c., respectively, with detachable rubber tube and mouth piece, after the style of a blood diluting pipet for counting blood cells. It is used in the same manner in obtaining blood from the patient. The finger or ear is cleaned with alcohol or iodin and pricked with a pin point cleaned with the same drug. The blood is drawn to the 0.1 c.c. mark and distilled water to the 0.8 c.c. mark (one volume of blood: seven volumes of distilled water). It is shaken until complete hemolysis results. The drawing shows also: (*b*) an extra heavy pyrex centrifuge tube; (*c*) a glass stirring rod; (*d*) a 1 c.c. pipet graduated in 0.1 c.c.; (*e*) a 0.5 c.c. Oswald-Folin pipet with detachable plain rubber tube, and (*f*) a set of Folin sugar tubes. The bulb contains 1 c.c. graduated at 6.25 c.c., for total measurement. This is all the apparatus needed for the micro-Folin-Wu method of blood sugar estimation.

The simplicity and accuracy of this method, the apparatus illustrated here being used, has been definitely proved by using it with the original Folin-Wu method as a control on a sufficient number of specimens of blood, obtained from patients with diabetes and a number of others without diabetes, with the same end-results. This will be reported in detail later.

575 Layton Boulevard.

* From the Laboratory of the Sacred Heart Sanitarium.

SUBCUTANEOUS EMPHYSEMA FOLLOWING THE REMOVAL OF A LOWER WISDOM TOOTH

LESTER RICHARD CAHN, D.D.S., NEW YORK

Rosenbaum [1] recently reported a case of subcutaneous emphysema following a tonsillectomy. In the case here reported, a similar condition followed the removal of a lower wisdom tooth.

I removed the lower left third molar in a woman, aged 65. The operation was done under local anesthesia, the inferior dental nerve being blocked at the inferior dental foramen, and 3 c.c. of a 2 per cent. procain-epinephrin solution being used. The tooth, having three distinct roots (a rarity in itself), was removed with considerable difficulty. The distobuccal root fractured during the delivery of the tooth, necessitating the removal of a portion of the outer alveolar plate in order to remove the fractured fragment. The wound was irrigated and dressed with iodoform gauze. The patient left the office feeling perfectly well.

About two hours later she returned with the cheek and neck on the left side swollen, but not painful. On palpating the swelling, I felt a distinct crackling. While she was sitting in the chair, the tissues about the left eye, and of the temporal and parietal regions, began to swell. There was no trismus, and on opening the mouth the patient could feel, or rather hear, the peculiar crackling sound. Respiration was not interfered with, although there was some difficulty in swallowing. The temperature and pulse were normal. I removed the iodoform gauze from the wound and ordered a solution of hamamelis, as a wet dressing, to be kept on the face over the swollen parts.

In four days the swelling disappeared. At no time was there any pain, and the operative wound healed rapidly.

895 West End Avenue.

1. Rosenbaum, Charles: Subcutaneous Emphysema Following Tonsillectomy, J. A. M. A. 82: 2119 (June 28) 1924.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

SILVER-SALVARSAN (See New and Nonofficial Remedies, 1924, p. 54).

The following dosage form has been accepted:

Silver-Salvarsan, 0.6 Gm. Ampules.

DIPHTHERIA TOXIN-ANTITOXIN MIXTURE (See New and Nonofficial Remedies, 1924, p. 299).

Parke, Davis & Company, Detroit.

Diphtheria Toxin-Antitoxin Mixture, 0.1 L+.—Diphtheria Prophylactic: Each cubic centimeter of the mixture represents 0.1 L+ dose of diphtheria toxin neutralized with the required amount of antitoxin. Marketed in packages of three bulbs, each containing 1 Cc. (*Bio. 67*) representing one immunizing treatment; also in vials containing 20 Cc. (*Bio. 69*).

MEDICAL EDUCATION IN THE UNITED STATES

ANNUAL PRESENTATION OF EDUCATIONAL DATA FOR 1924 BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The tabulated statistics herewith presented for the year ending June 30, 1924, are based on reports received from the medical colleges and other reliable sources. We acknowledge here the splendid courtesy and cooperation of the officers of the colleges who have made the compilation of these complete statistics possible.

STATISTICS OF COLLEGES

Table 1, on pages 510, 511, gives the colleges in session during 1923-1924; the population of the city; the rating given to the college by the Council on Medical Education and Hospitals; the number of students, men and women, registered during the year; the number of 1924 graduates, men and women; the number of graduates holding collegiate degrees; the number of teachers for each college; the number of weeks of actual work in the college year; the total fees for each year; the executive officer of the college, and the dates of beginning and ending of the next session. The figures in heavy-faced type show the totals by states. Beginning on page 521 are given essential facts concerning all medical colleges arranged by states.

HOME STATES OF MEDICAL STUDENTS

Table 2, on pages 514, 515, shows from what state the students came who were in attendance at each medical college during the session of 1923-1924. The influence of the proximity of the medical school is seen in the fact that states having medical colleges contribute larger numbers of students than those which have no colleges. This is shown by the dark zone of figures running diagonally down the page. A comparison of this table with the large tables based on state board examinations,[1] which show the distribution of the alumni of each college, is interesting. The college that has widely distributed alumni usually has a student body from an equally large number of states.

The state furnishing the largest number of students this year was New York with 2,500. Pennsylvania contributed 1,365 and Illinois, 1,308. The next states, in the order of the number of students contributed, are: Ohio, 968; Massachusetts, 773; Michigan, 648; California and Texas each 606, and Missouri, 542. Of the twelve states which have no medical schools only two furnished more than 100 students, these being New Jersey and Washington. Of these noncollege states Nevada had only 4 and Wyoming 10. There were 106 students from Hawaii, Porto Rico and the Philippine Islands, and 302 students from foreign countries.

NUMBER OF STUDENTS BY CLASSES

In Table 3, on page 517, the students enrolled in each college are shown by classes. This permits one to see whether the attendance at each college is increasing or decreasing. The total attendance for the first year was 5,160, or 2 less than last year, and 252 less than in 1922. The second year attendance was 4,441, or 174 less than last year, but 222 more than in 1922. The third year attendance was 4,430, or 529 more than last year and 975 more than in 1922. The enrolment of the fourth year class was 3,797, or 475 more than last year, and 1,148 more than in 1922.

NUMBER OF MEDICAL STUDENTS

The total number of medical students (Table 4) in the United States for the year ending June 30, 1924, excluding premedical, special and postgraduate students, was 17,728, an increase of 296 over last year. This is the largest enrolment of students since 1912. There has been a steady increase in enrolments since 1919. Of the total number of students, 17,034 were in attendance at the nonsectarian (regular) colleges, 379 at the homeopathic, 127 at the eclectic, and 188 at the three nondescript colleges.

TABLE 4.—*Medical College Attendance*

Year	Non-sectarian	Homeopathic	Eclectic	Physio-Med.	Nondescript	Total
1880	9,776	1,220	830	...	...	11,826
1890	13,521	1,164	719	...	...	15,404
1900	22,710	1,909	522	...	...	25,171
1901	23,846	1,683	664	80	144	26,417
1902	24,878	1,617	765	91	150	27,501
1903	24,930	1,498	848	149	190	27,615
1904	23,602	1,309	1,014	123	234	28,142
1905	24,119	1,104	578	114	232	26,147
1906	23,116	1,085	644	110	249	25,204
1907	22,203	1,039	545	97	292	24,276
1908	20,936	891	479	90	206	22,602
1909	20,554	899	413	52	227	22,145
1910	20,136	867	455	49	19	21,526
1911	18,414	890	433	49	...	19,786
1912	17,277	827	308	...	...	18,412
1913	15,919	850	256	...	...	17,015
1914	15,438	794	270	...	...	16,502
1915	13,914	736	241	...	...	14,891
1916	13,121	638	263	...	...	14,012
1917	12,925	580	250	...	...	13,764
1918	12,727	540	138	...	225	13,630
1919	12,137	397	86	...	310	12,930
1920	12,930	386	93	...	389	13,798
1921	13,627	440	98	...	301	14,466
1922	14,742	517	85	...	291	15,635
1923	16,299	341	99	...	221	16,960
1924	17,034	379	127	...	188	17,728

The total number of graduates for the year ending June 30, 1924, was 3,562, or 442 more than last year. The number of graduates from the nonsectarian colleges was 3,395, or 411 more than last year. The number from the homeopathic colleges was 74, or 25 less than last year, and from the eclectic college there was 27, or 11 more than last year. The three non-

(Continued on page 512)

1. State Board Number, J. A. M. A. 82: 1344-1347 (April 26) 1924.

TABLE 1—STATISTICS OF MEDICAL COLLEGES IN THE UNITED STATES AND CANADA

Marginal Number	NAME AND LOCATION OF COLLEGE	Population of City Where College Is Located (Census Bureau Estimate of 1920)	Classification by Council on Medical Education	No. of Students Registered 1923-24		Graduates 1924		Grads. with A.B., B.S., or Ph.B.	Number of Teachers	Weeks in College Year	Total Fees (Dollars)				Executive Officer	Session of 1924-25		Marginal Number
				Men	Women	Men	Women				1st Year	2d Year	3d Year	4th Year		Begins 1924	Ends 1925	
	ALABAMA			**69**	**1**	..	..	..										
1	University of Alabama School of Medicene, University (Tuscaloosa)*	11,996	A	69	1	..	..	..	13	33	260	260	...	...	Clyde Brooks, M.D., Dean	Sept. 10	May 26	1
	ARKANSAS			**113**	**1**	**10**	..	**7**										
2	University of Arkansas Medical Department, Little Rock †	65,142	A	113	1	10	..	7	42	31	55	55	55	55	Arthur R. Stover, M.D., Acf. Dean	Sept. 17	June 4	2
	CALIFORNIA			**497**	**86**	**104**	**22**	**115**										
3	College of Medical Evangelists, Los Angeles	576,673	A	203	20	52	6	53	146	36	221	263	258	255	Newton Evans, M.D., President	Sept. 3	May 31	3
4	Stanford University School of Medicine, San Francisco	506,676	A	126	23	21	4	25	158	34	261	261	261	261	William Ophüls, M.D., Dean	Oct. 2	June 17	4
5	University of California Medical School, San Francisco †	506,676	A	168	43	31	12	37	221	36	290	248	235	225	L. S. Smith, M.D., Act. Dean	Aug. 15	May 13	5
	COLORADO			**102**	**16**	**14**	**4**	**5**										
6	University of Colorado School of Medicine, Denver †	256,491	A	102	16	14	4	5	61	34	211	211	176	181	Charles N. Meader, M.D., Dean	Sept. 29	June 15	6
	CONNECTICUT			**187**	**9**	**43**	**1**	**34**										
7	Yale University School of Medicine, New Haven	162,537	A	187	9	43	1	34	165	34	305	300	300	320	Milton C. Winternitz, M.D., Dean	Sept. 25	June 10	7
	DISTRICT OF COLUMBIA			**955**	**16**	**86**	**4**	**43**										
8	Georgetown University School of Medicine, Washington	437,571	A	197	..	34	..	10	101	34	215	200	200	210	George M. Kober, M.D., Dean	Sept. 26	June 9	8
9	George Washington University Medical School, Washington	437,571	A	228	10	27	2	13	132	33	281	278	278	268	William C. Borden, M.D., Dean	Sept. 24	June 3	9
10	Howard University School of Medicine, Washington	437,571	A	230	6	25	2	20	52	33	168	158	158	165	Edward A. Balloch, M.D., Dean	Oct 1	June 5	10
	GEORGIA			**243**	**4**	**88**	..	**60**										
11	Emory University School of Medicine, Atlanta	200,616	A	222	..	57	..	41	115	34	253	233	228	253	William S. Elkin, M.D., Dean	Sept. 24	June 9	11
12	University of Georgia Medical Department, Augusta †	52,548	A	121	4	31	..	19	52	34	105	100	100	100	William H. Goodrich, M.D., Dean	Sept. 15	June 1	12
	ILLINOIS			**1810**	**103**	**368**	**15**	**272**										
13	Chicago Medical School, Chicago	2,701,705	C	131	6	23	..	..	...	...	...	...	...	...		.....	.....	13
14	General Medical College, Chicago [1]	2,701,705	B	98	5	42	2	6	...	...	...	...	...	...		.....	.....	14
15	Loyola University School of Medicine, Chicago	2,701,705	A	279	10	23	0	11	114	34	300	300	300	300	Louis D. Moorhead, M.D., Dean	Oct. 1	June 13	15
16	Northwestern University Medical School, Chicago	2,701,705	A	423	..	93	..	62	183	34	220	220	216	210	Charles W. Patterson, Ph.C., Registrar	Sept. 30	June 13	16
17	Rush Medical College (University of Chicago)	2,701,705	A	467	66	117	12	127	294	34	240	240	240	240	Ernest E. Irons, M.D., Acting Dean	Oct. 1	June 13	17
18	University of Illinois College of Medicine, Chicago †	2,701,705	A	412	16	70	1	66	203	33	165	165	165	165	Albert C. Eycleshymer, M.D., Dean	Oct. 6	June 12	18
	INDIANA			**330**	**16**	**67**	**3**	**69**										
19	Indiana University School of Medicine, Bloomington-Indianapolis	314,194	A	330	16	67	3	69	165	35	175	175	175	175	Charles P. Emerson, M.D., Dean	Sept. 15	June 10	19
	IOWA			**358**	**7**	**49**	..	**32**										
20	State University of Iowa College of Medicine, Iowa City †	11,267	A	358	7	49	..	32	80	34	185	175	175	185	Lee Wallace Dean, M.D., Dean	Sept. 22	June 6	20
	KANSAS			**120**	**17**	**23**	..	**15**										
21	University of Kansas School of Medicine, Lawrence-Rosedale †	433,261	A	120	17	23	..	15	55	36	125	125	145	145	Mervin T. Sudler, M.D., Dean	Sept. 10	June 9	21
	KENTUCKY			**243**	**7**	**46**	**2**	**20**										
22	University of Louisville Medical Department, Louisville	234,891	A	243	7	46	2	20	112	36	260	260	270	290	Stuart Graves, M.D., Dean	Sept. 8	June 4	22
	LOUISIANA			**349**	**13**	**80**	**4**	**44**										
23	Tulane University of Louisiana School of Medicine, New Orleans	387,219	A	349	13	80	4	44	142	34	235	235	225	255	Charles C. Bass, M.D., Dean	Sept. 25	June 10	23
	MARYLAND			**600**	**47**	**142**	**16**	**109**										
24	Johns Hopkins University Medical Department, Baltimore	733,826	A	268	39	67	13	80	236	33	311	317	317	317	Lewis H. Weed, M.D., Dean	Sept. 29	June 9	24
25	Univ. of Maryland School of Med. and Coll. of P. & S., Baltimore †	733,826	A	332	8	75	3	29	210	33	265	265	265	265	J. M. H. Rowland, M.D., Dean	Sept. 29	June 6	25
	MASSACHUSETTS			**1298**	**54**	**328**	**12**	**141**										
26	Boston University School of Medicine, Boston	748,060	A	183	25	44	2	18	99	35	281	281	256	266	Alexander S. Begg, M.D., Dean	Sept. 22	June 15	26
27	College of Physicians and Surgeons, Boston [2]	748,060	C	26	..	7	..	..	...	...	...	...	...	...		.....	.....	27
28	Harvard University Medical School, Boston	748,060	A	494	..	123	..	103	305	36	305	300	300	300	David L. Edsall, M.D., Dean	Sept. 22	June 18	28
29	Tufts College Medical School, Boston	748,060	A	483	24	120	7	20	156	33	260	245	235	240	Stephen Rushmore, M.D., Dean	Sept. 23	May 29	29
30	Middlesex College of Medicine and Surgery, Cambridge.—N.	109,694	C	112	5	25	3	..	...	...	...	...	...	...		.....	.....	30
	MICHIGAN			**751**	**37**	**152**	**11**	**68**										
31	University of Michigan Medical School, Ann Arbor † [4]	19,516	A	563	34	128	10	67	140	35	237	220	220	220	Hugh Cabot, M.D., Dean	Sept. 23	June 15	31
32	Detroit College of Medicine and Surgery, Detroit †	993,678	A	188	3	24	1	1	116	35	145	145	145	145	W. H. MacCracken, M.D., Dean	Sept. 29	June 20	32
	MINNESOTA			**379**	**32**	**56**	**2**	**58**										
33	University of Minnesota Medical School, Minneapolis †	380,582	A	379	32	56	2	58	280	34	202	202	202	202	Elias P. Lyon, M.D., Dean	Sept. 29	June 15	33
	MISSISSIPPI			**66**	**2**	..	..	..										
34	University of Mississippi School of Medicine, Oxford *	2,150	A	66	2	..	..	..	18	34	168	168	...	...	Joseph O. Crider, M.D., Dean	Sept. 17	June 2	34
	MISSOURI			**873**	**17**	**212**	**5**	**131**										
35	University of Missouri School of Medicine, Columbia * †	10,392	A	75	2	..	..	..	26	35	106	105	...	...	Guy L. Noyes, M.D., Dean	Sept. 10	June 3	35
36	Kansas City College of Medicine and Surgery, Kansas City.—N. [3] [5]	433,261	[5]	17	..	17	..	..	...	...	...	...	...	...		.....	.....	36
37	Kansas City Univ. of Physicians and Surgeons, Kansas City.—N.	433,261	C	51	3	20	1	..	...	...	...	.. .	...	...		.....	.....	37
38	St. Louis College of Physicians and Surgeons, St. Louis [3] [6]	772,897	C	19	..	8	..	..	...	...	...	...	...	...		.....	.....	38
39	St. Louis University School of Medicine, St. Louis	772,897	A	432	..	94	..	81	203	32	300	300	300	300	Hanau W. Loeb, M.D., Dean	Oct. 1	May 31	39
40	Washington University School of Medicine, St. Louis	772,897	A	279	12	73	4	50	165	34	315	310	310	315	McKim Marriott, M.D., Dean	Sept. 25	June 11	40
	NEBRASKA			**465**	**26**	**87**	**3**	**61**										
41	Creighton University College of Medicine, Omaha	191,601	A	161	3	38	..	33	73	34	200	190	190	200	Hermann von W. Schulte, M.D., Dean	Sept. 24	June 6	41
42	University of Nebraska College of Medicine, Omaha	191,601	A	304	17	49	3	48	98	35	180	170	160	160	Irving S. Cutter, M.D., Dean	Sept. 15	June 6	42
	NEW HAMPSHIRE			**44**	..	..	..	..										
43	Dartmouth Medical School, Hanover*	1,551	A	44	..	..	..	..	13	37	260	260	...	...	John M. Gile, M.D., Dean	Sept. 17	June 23	43

41	Creighton University College of Medicine, Omaha	191,601	A	304	17	49	3	48	98	35	180	170	160	160	Irving S. Cutter, M.D., Dean	Sept. 15	June 6	42
	NEW HAMPSHIRE			44	..	..	..	..																
43	Dartmouth Medical School, Hanover*	1,551	A	44	..	..	..	..	13	37	260	260	...	...	John M. Gile, M.D., Dean	Sept. 17	June 23	43
	NEW YORK			1907	188	399	42	202																
44	Albany Medical College, Albany	118,344	A	86	3	16	2	5	102	34	320	305	305	305	Thomas Ordway, M.D., Dean	Sept. 22	June 8	44
45	University of Buffalo Medical Department, Buffalo	506,775	A	225	19	54	7	12	145	34	327	317	317	227	C. Sumner Jones, M.D., Dean	Sept. 22	June 10	45
46	Columbia University College of Phys. and Surgs., New York City	5,620,048	A	333	44	77	11	84	816	33	332	332	332	352	William Darrach, M.D., Dean	Sept. 24	June 3	46
47	Cornell University Medical College, New York City	5,620,048	A	179	51	46	12	58	183	34	345	335	335	350	Walter L. Niles, M.D., Dean	Sept. 24	June 11	47
48	Long Island College Hospital, New York City-Brooklyn	5,620,048	A	350	7	46	2	6	159	33	366	356	381	386	Adam M. Miller, M.D., Dean	Sept. 22	May 28	48
49	New York Homeopathic Medical College and Flower Hospital.—H	5,620,048	B	159	10	27	2	1	86	34	360	350	350	380	Israel S. Kleiner, Ph.D., Dean	Sept. 19	June 2	49
50	University and Bellevue Hospital Medical College, New York City	5,620,048	A	406	22	96	5	30	237	35	372	374	329	347	Samuel A. Brown, M.D., Dean	Sept. 17	June 10	50
51	Syracuse University College of Medicine, Syracuse	171,717	A	169	12	37	1	6	116	35	340	340	340	350	Herman G. Weiskotten, M.D., Dean	Sept. 22	June 15	51
	NORTH CAROLINA			132	..	..	..	..																
52	University of North Carolina School of Medicine, Chapel Hill*	1,482	A	69	..	..	..	..	13	34	195	195	...	...	I. H. Manning, M.D., Dean	Sept. 18	June 5	52
53	Wake Forest College School of Medicine, Wake Forest*	1,425	A	63	..	..	..	..	16	34	200	200	...	...	Thurman D. Kitchin, M.D., Dean	Sept. 16	June 5	53
	NORTH DAKOTA			35	1	..	..	..																
54	Univ. of North Dakota School of Med., University (Grand Forks)*	14,010	A	35	1	..	..	..	15	35	50	50	...	...	H. E. French, M.D., Dean	Sept. 20	June 9	54
	OHIO			803	32	171	8	113																
55	Eclectic Medical College, Cincinnati.—E	401,247	B	127	..	27	..	2	52	32	170	160	160	160	Rolla L. Thomas, M.D., Dean	Sept. 18	May 18	55
56	University of Cincinnati College of Medicine	401,247	A	224	13	63	1	36	...	...	...	...	...	...	Henry Page, M.D., Dean	Sept. 20	June 13	56
57	Western Reserve University School of Medicine, Cleveland	796,841	A	181	10	39	3	40	166	35	275	265	250	260	Carl A. Hamann, M.D., Dean	Sept. 25	June 18	57
58	Ohio State University College of Medicine, Columbus †	237,031	A	271	9	42	4	35	165	34	153	153	153	153	Eugene F. Campbell, M.D., Dean	Sept. 30	June 16	58
	OKLAHOMA			141	7	21	..	20																
59	University of Oklahoma School of Med., Norman-Oklahoma City	91,295	A	141	7	21	..	20	78	35	100	100	21	21	LeRoy Long, M.D., Dean	Sept. 15	June 9	59
	OREGON			189	13	38	3	20																
60	University of Oregon Medical School, Portland †	258,288	A	189	13	38	3	20	138	34	185	180	180	180	Richard B. Dillehunt, M.D., Dean	Sept. 30	June 15	60
	PENNSYLVANIA			1627	156	361	44	182																
61	Hahnemann Medical College and Hospital of Philadelphia.—H	1,823,779	A	210	..	45	..	26	114	33	200	200	200	200	William A. Pearson, M.D., Dean	Sept. 30	June 4	61
62	Jefferson Medical College of Philadelphia	1,823,779	A	506	..	145	..	40	175	34	335	325	325	325	Ross V. Patterson, M.D., Dean	Sept. 23	June 5	62
63	Temple University School of Medicine, Philadelphia	1,823,779	B	177	7	15	..	3	135	35	230	225	215	215	Frank C. Hammond, M.D., Dean	Sept. 22	June 18	63
64	University of Pennsylvania School of Medicine, Philadelphia [4]	1,823,779	A	453	21	125	7	70	224	35	333	325	325	329	William Pepper, M.D., Dean	Sept. 25	June 17	64
65	Woman's Medical College of Pennsylvania, Philadelphia	1,823,779	A	...	110	..	32	16	67	33	275	279	277	269	Martha Tracy, M.D., Dean	Sept. 24	June 3	65
66	University of Pittsburgh School of Medicine, Pittsburgh	588,343	A	194	18	31	5	27	150	33	328	313	313	323	Raleigh R. Huggins, M.D., Dean	Sept. 29	June 10	66
	SOUTH CAROLINA			144	3	28	..	13																
67	Medical College of the State of South Carolina, Charleston	67,957	A	144	3	28	..	13	68	33	165	165	165	165	Robert Wilson, Jr., M.D., Dean	Sept. 25	June 4	67
	SOUTH DAKOTA			35	1	..	..	..																
68	University of South Dakota College of Medicine, Vermilion*	2,500	A	35	1	..	..	..	11	36	60	60	...	...	Christian P. Lommen, B.S., Dean	Sept. 15	June 13	68
	TENNESSEE			568	5	132	2	52																
69	University of Tennessee College of Medicine, Memphis †	102,351	A	205	4	46	1	17	125	34	107	102	102	127	James B. McElroy, M.D., Dean	Sept. 27	June 8	69
70	Meharry Medical College, Nashville	118,342	A	171	1	37	1	27	44	31	162	162	155	175	John J. Mullowney, M.D., President	Oct. 1	May 21	70
71	Vanderbilt University School of Medicine, Nashville	118,342	A	192	..	49	..	8	109	34	200	200	200	225	Lucius E. Burch, M.D., Acting Dean	Sept. 24	June 10	71
	TEXAS			437	20	85	4	38																
72	Baylor University College of Medicine, Dallas	158,976	A	198	8	17	2	12	95	32	208	198	188	188	Walter H. Moursund, M.D., Dean	Sept. 29	June 1	72
73	University of Texas School of Medicine, Galveston †	44,255	A	244	12	68	2	26	50	32	108	83	45	43	William Keiller, M.D., Dean	Oct. 1	May 31	73
	UTAH			46	..	..	..	..																
74	University of Utah School of Medicine, Salt Lake City*	118,110	A	46	..	..	..	..	26	33	150	150	...	...	Ralph O. Porter, M.D., Dean	Sept. 25	June 5	74
	VERMONT			120	6	32	1	10																
75	University of Vermont College of Medicine, Burlington †	22,779	A	120	6	32	1	10	43	37	200	200	200	200	Henry Crain Tinkham, M.D., Dean	Sept. 18	June 22	75
	VIRGINIA			481	15	98	6	47																
76	Medical College of Virginia, Richmond	171,667	A	294	9	69	5	33	125	34	280	280	270	300	Manfred Call, M.D., Dean	Sept. 17	June 2	76
77	University of Virginia Department of Medicine, Charlottesville	10,688	A	187	6	29	1	14	47	36	235	235	185	175	Theodore Hough, Ph.D., Dean	Sept. 18	June 16	77
	WEST VIRGINIA			104	2	..	..	..																
78	West Virginia University School of Medicine, Morgantown* †	12,127	A	104	2	..	..	..	16	36	55	60	...	...	John N. Simpson, M.D., Dean	Sept. 15	June 11	78
	WISCONSIN			362	20	28	..	28																
79	University of Wisconsin Medical School, Madison* †	38,378	A	142	15	..	..	..	70	36	115	95	...	...	Charles R. Bardeen, M.D., Dean	Sept. 24	June 22	79
80	Marquette University School of Medicine, Milwaukee	457,147	A	220	5	28	..	28	121	34	313	303	303	283	Eben J. Carey, M.D., Dean	Sept. 29	June 10	80
	PHILIPPINE ISLANDS			104	38	7	4	10																
81	University of the Philippines, College of Med. and Surg., Manila	266,943	..	104	38	7	4	10	77	36	81	74	59	56	Fernando Calderon, M.D., Dean	June 16	Mar. 17	81
	CANADA [7]			2539	133	621	24	119																
82	University of Alberta Faculty of Medicine, Edmonton, Alta.	60,000	A	98	11	..	..	..	80	30	180	180	180	180	Allan C. Rankin, M.D., Dean	Sept. 29	May 15	82
83	Dalhousie University Faculty of Medicine, Halifax, N. S.	46,619	B	107	10	30	2	5	50	32	132	200	200	200	John Stewart, M.D., Dean	Sept. 10	May 12	83
84	Queen's University Faculty of Medicine, Kingston, Ont.	18,874	B	272	2	63	2	11	51	31	141	146	141	155	J. C. Connell, M.D., Dean	Oct. 1	May 20	84
85	University of Toronto Faculty of Medicine, Toronto, Ont.	376,538	A	801	72	195	14	16	235	32	163	163	163	163	Alexander Primrose, M.D., Dean	Sept. 30	May 30	85
86	University of Western Ontario Medical School, London, Ont.	46,300	B	91	2	24	1	..	59	33	155	155	163	163	Paul S. McKibben, Ph.D., Dean	Sept. 23	May 25	86
87	McGill University Faculty of Medicine, Montreal, Que.	470,480	A	595	18	163	3	30	208	33	220	220	220	220	Charles F. Martin, M.D., Dean	Sept. 22	May 30	87
88	University of Montreal Medical Faculty, Montreal, Que.	470,480	B	155	..	73	..	55	81	36	207	200	242	214	Louis de Lotbiniere Harwood, M.D., Dean	Sept. 15	June 15	88
89	Laval University Faculty of Medicine, Quebec, Que.	78,190	B	108	..	23	..	..	37	..	135	135	135	135	Arthur Vallee, M.D., Dean	Sept. 15	May 29	89
90	University of Manitoba Faculty of Medicine, Winnipeg	136,035	A	212	18	50	2	12	112	34	180	175	185	185	S. Willis Prowse, M.D., Dean	Sept. 29	May 29	90

E.—Eclectic; H.—Homeopathic; N.—Nondescript.

* Gives only the first two years of the medical course.

† The following universities make an additional charge for nonresidents: Arkansas, $50; California, $300; Colorado, $105; Georgia, $200; Illinois, $35; Indiana, $75; Iowa, $175; Kansas, $10; Maryland, $50; Michigan, $80; Detroit, $55; Minnesota, $30; Missouri, $10; Ohio, $105; Oregon, $60; Tennessee, $100; Texas, $150; Vermont, $100; West Virginia, $190; Wisconsin, $95.

1. The General Medical College has been closed.

2. The numbers of students and graduates are approximate.

3. This school was closely involved in the Missouri Diploma Mill Scandal as shown by the drastic report regarding it, issued by the Connecticut Special Grand Jury, March 14, 1924. See THE JOURNAL, April 5, 1924, page 1140, and April 12, 1924, page 1219.

4. Two medical schools make a lower tuition charge for women than for men. The charge is $5 less each year at the University of Michigan and $15 less at the University of Pennsylvania.

5. This college is an offshoot of a Class C institution, which has since ceased to exist. Inspections have been refused by the new institution but sufficient information is on file to show that it could not be given a rating higher than Class C. It is reported not recognized by the licensing boards of forty-four states. The only report received regarding students in this school included names of 17, all of whom were said to have received degrees.

6. The number of students is exact; the number of graduates is approximate.

7. Of the Canadian medical schools, the University of Alberta gives the first five years of the six year medical course. All others give the six years. The first one or two years are devoted to subjects which in the United States are referred to as "premedical."

(Continued from page 509)

descript colleges had 66 graduates, or 5 less than last year.[2]

TABLE 5.—*Medical College Graduates*

Year	Non-sectarian	Homeo-pathic	Eclectic	Physio-Med.	Nonde-script	Total
1880	2,673	380	188	..	..	3,241
1890	3,853	380	221	..	..	4,454
1900	4,715	413	86	..	..	5,214
1901	4,879	387	148	18	12	5,444
1902	4,508	336	138	16	11	5,009
1903	5,088	420	149	24	17	5,698
1904	5,190	371	146	20	20	5,747
1905	5,126	276	153	22	23	5,600
1906	4,841	286	186	22	29	5,364
1907	4,591	225	121	11	32	4,980
1908	4,370	215	116	12	28	4,741
1909	4,163	209	84	15	44	4,515
1910	4,113	183	114	16	14	4,440
1911	4,006	152	110	5	..	4,273
1912	4,206	185	92	..	..	4,483
1913	3,679	209	93	..	..	3,981
1914	3,370	154	70	..	..	3,594
1915	3,286	195	55	..	..	3,536
1916	3,274	166	78	..	..	3,518
1917	3,134	180	65	..	..	3,379
1918	2,454	114	42	..	60	2,670
1919	2,423	89	28	..	116	2,656
1920	2,826	97	30	..	94	3,047
1921	2,969	115	30	..	78	3,192
1922	2,358	64	34	..	73	2,529
1923	2,984	49	16	..	71	3,120
1924	3,395	74	27	..	66	3,562

GRADUATES HOLDING DEGREES IN ARTS

Of the 3,562 medical graduates, 2,020 (see Table 6) also obtained degrees in arts or science, or 233 more than last year. There has been a steady increase since 1910, when attention was first called to this item. This year 56.7 per cent. of all graduates held collegiate degrees, as compared with 57.2 per cent. last year and with only 15.3 per cent. in 1910. This increase is what was expected under the general adoption by medical schools of the entrance requirement of two years of college work. Of the 3,395 nonsectarian school graduates, 1,991 or 58.6 per cent., were reported to have baccalaureate degrees; of the 74 homeopathic graduates, 27, or 36.5 per cent., were so reported, and of the 27 eclectic graduates, 2, or 7.4 per cent., were so reported; and of the 66 graduates of the nondescript colleges none were reported as holding a bachelor's degree in arts or science. As will be noted by referring to Table 11, of the 2,020 graduates holding baccalaureate degrees, 272—the largest number—came from the Illinois colleges. New York reported 202, Pennsylvania reported 182, Massachusetts reported 141, and Ohio reported 113. The percentage of graduates holding collegiate degrees will probably continue to increase, since all the better medical schools are now requiring two years of college work for admission, which brings more students in reach of the combined course for the B.S. and M.D. degrees.

TABLE 6.—*Medical Graduates with Liberal Arts Degrees*

	Nonsectarian			Homeopathic			Eclectic			Totals		
Year	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.	Graduates	A.B., B.S.	Per Cent.
1910	4,113	664	16.1	183	13	7.1	114	3	2.6	4,440	680	15.3
1911	4,006	683	17.0	152	18	11.8	110	4	3.6	4,273	705	16.5
1912	4,206	744	17.7	185	15	8.1	92	4	4.3	4,483	763	17.0
1913	3,679	732	19.9	209	20	9.6	93	1	1.1	3,981	753	18.9
1914	3,370	794	23.5	154	7	4.5	70	6	8.6	3,594	807	22.5
1915	3,286	839	25.5	195	16	8.2	55	3	5.5	3,536	858	24.3
1916	3,274	928	28.3	166	20	12.0	78	...	...	3,518	948	26.9
1917	3,134	1,078	34.4	180	19	10.5	65	2	3.1	3,379	1,099	32.5
1918	2,454	1,007	41.0	114	15	13.2	60	...	...	2,670	1,024	38.4
1919	2,423	1,102	48.0	89	16	18.0	28	2	7.1	2,656	1,180	44.4
1920	2,826	1,307	46.2	97	11	11.3	30	3	10.0	3,043	1,321	43.5
1921	2,969	1,447	48.2	115	33	28.7	30	...	...	3,192	1,465	46.0
1922	2,358	1,440	61.1	64	13	20.3	34	2	5.9	2,529	1,455	57.5
1923	2,984	1,770	59.3	49	13	26.5	16	3	18.7	3,120	1,787	57.3
1924*	3,395	1,991	58.6	74	27	36.5	27	2	7.4	3,562	2,020	56.7

* Only two graduates of nondescript colleges were reported to have collegiate degrees during the last seven years.

WOMEN IN MEDICINE

During the past year there were 954 women studying medicine, or 73 less than last year. The percentage of women to all medical students this year is 5.4. There were 214 women graduates this year, 3 more than last year. Of all the women matriculants, 110 were in attendance at and 32 graduated from the one medical college for women, while 844 (88.5 per cent.) were matriculated in, and 182 (85.2 per cent.) graduated from the coeducational colleges.

TABLE 7.—*Medical Colleges*

Year	Non-sectarian	Homeo-pathic	Eclectic	Physio-Med.	Nonde-script	Total
1850	44	3	4	1	..	52
1860	53	6	4	2	..	65
1870	60	8	5	2	..	75
1880	76	14	8	2	..	100
1890	106	16	9	2	..	133
1900	126	22	9	2	1	160
1901	125	22	10	2	1	160
1902	126	20	9	3	2	160
1903	126	20	9	3	2	160
1904	127	19	9	3	2	160
1905	125	19	9	3	2	158
1906	130	19	8	3	2	162
1907	127	18	9	3	2	159
1908	120	18	9	2	2	151
1909	115	15	8	1	1	140
1910	109	13	8	1	1	131
1911	103	12	7	..	..	122
1912	101	11	6	..	..	118
1913	92	10	5	..	..	107
1914	87	10	5	..	..	102
1915	83	9	4	..	..	96
1916	82	10	3	..	..	95
1917	83	9	4	..	..	96
1918	79	6	2	..	3	90
1919	76	5	1	..	3	85
1920	76	5	1	..	3	85
1921	74	5	1	..	3	83
1922	74	3	1	..	3	81
1923	74	2	1	..	3	80
1924	73	2	1	..	3	79

NUMBER OF COLLEGES

The number of medical colleges existing each year since 1900 is shown in Table 7. Since June 30, 1924, one medical college, the General Medical College, has been permanently closed. This was formerly the Hahnemann Medical College of Chicago. There are 79 colleges still existing. In the next year, it is announced, the new medical school of the University of Rochester, New York, will be open to receive medical students. This will bring the number back to 80.

Of the 79 colleges, 73 are nonsectarian (regular), 2 are homeopathic, 1 is eclectic and 3 are nondescript. Two of these nondescript colleges, the Kansas City University of Physicians and Surgeons, and the Middlesex College of Medicine and Surgery, are intimately connected with osteopathy or give liberal advanced

2. Two of these nondescript colleges, the Middlesex College of Medicine and Surgery and the Kansas City College of Medicine and Surgery, together with one regular college graded in Class C, the St. Louis College of Physicians and Surgeons, were involved in the Connecticut illegal license scandal, according to drastic reports regarding them which were issued by the Connecticut Special Grand Jury on March 14, 1924. These reports were published in THE JOURNAL on March 29, page 1067; April 12, page 1219; and April 5, on page 1140, respectively.

standing to students of osteopathic colleges. The third, the Kansas City College of Medicine and Surgery, claims to be eclectic, but is reported as not so recognized by the National Eclectic Medical Association. There are two so-called "regular" medical schools which, like the three just named, are of Class C grade.

The Kansas City College of Medicine and Surgery and the St. Louis College of Physicians and Surgeons and their deans were reported as being deeply involved in the Missouri diploma-mill ring which was exposed by the St. Louis *Star* last October. The five Class C colleges, because of their deficiency in the essentials for teaching, are reported as not recognized by the licensing boards of more than forty states. Whether the diplomas of these schools are purchased or obtained by actual attendance, therefore, their holders are not eligible to obtain licenses in any but a few states. When these few states secure adequate practice laws, the sale of medical diplomas will become an unprofitable business.

TABLE 8.—*College Terms*

Year	23 to 26 weeks		27 to 28 weeks		29 to 30 weeks		31 to 32 weeks		33 to 34 weeks		35 to 36 weeks		Over 36 weeks	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1901	58	36.5	42	26.4	8	5.0	26	16.4	4	2.5	18	11.3	3	1.9
1902	44	28.4	44	28.4	11	7.1	33	21.3	3	1.9	18	11.6	2	1.3
1903	33	21.4	46	29.9	15	9.7	37	24.0	2	1.3	19	12.4	2	1.3
1904	27	16.3	44	26.5	22	13.3	37	22.3	13	7.8	20	12.0	3	1.8
1905	15	9.4	35	21.8	12	7.5	44	27.5	13	8.1	28	23.8	3	1.9
1906	14	8.7	35	21.7	26	16.1	32	19.9	24	14.9	28	17.4	2	1.3
1907	6	3.7	27	16.8	26	16.1	42	26.1	29	18.0	29	18.0	2	1.3
1908	2	1.3	21	13.8	28	18.4	51	33.6	24	15.8	22	14.5	4	2.6
1909	4	2.3	17	11.6	23	16.4	51	34.9	18	12.3	30	20.5	3	2.0
1910	2	1.5	8	6.0	19	14.3	42	31.5	30	22.6	30	22.6	2	1.5
1911	..	...	6	5.0	16	13.3	37	30.8	32	26.7	28	23.4	1	0.8
1912	1	0.9	1	0.9	11	9.5	34	29.3	37	31.8	31	26.7	1	0.9
1913	..	...	3	2.8	5	4.7	29	27.4	41	38.7	27	25.5	1	0.9
1914	..	...	2	2.0	4	4.0	25	24.8	41	40.5	28	27.7	1	1.0
1915	..	...	1	1.0	5	5.3	22	23.2	36	37.9	30	31.6	1	1.0
1916	..	...	..	...	4	4.2	17	17.9	43	45.3	28	29.5	..	...
1917	..	...	..	...	1	1.0	15	15.6	46	47.9	31	32.3	..	...
1918	..	...	..	...	2	2.2	23	25.6	37	41.1	22	24.4	..	...
1919	..	...	..	...	1	1.2	11	12.9	44	51.8	23	27.1	1	1.2
1920	..	...	..	...	1	1.2	10	11.8	38	44.7	29	34.1	..	...
1921	..	...	..	...	..	...	11	13.1	39	46.4	28	33.3	..	...
1922	..	...	..	...	..	...	10	13.1	43	56.6	23	30.3	..	...
1923	..	...	..	...	..	...	6	7.5	48	60.0	22	25.0	..	...
1924*	..	...	..	...	..	...	6	7.6	44	55.7	23	29.0	..	...

*Information not furnished by six Class C colleges.

LENGTH OF TERMS

During the last twenty-four years, as shown in Table 8, there has been a decided lengthening of college terms. This has reference to the weeks of actual work exclusive of holidays. Prior to 1904 the majority of colleges had sessions of twenty-eight weeks or less. Since then the percentage of colleges having sessions of 33 to 34 weeks has increased from 2.5 to 60.0. For nine years no colleges have had sessions shorter than twenty-nine weeks, and for four years the shortest session reported has been thirty-one weeks. Sessions of from thirty-three to thirty-six weeks were reported by 67, or 84.7 per cent., of all colleges. The medical schools which in prior years reported sessions of longer than 36 weeks were night schools.

TUITION AND OTHER FEES

Attention is called in Table 1, on pages 510, 511, to the amount charged by the various medical colleges per annum for tuition, matriculation, and laboratory and graduation fees for each student. In Table 9, the 79 colleges have been grouped according to the amount of fees charged and according to their classification by the Council on Medical Education and Hospitals. Twelve colleges charge fees of $125 or less per year; thirty between $125 and $225; twenty-nine between $225 and $325, and eight charge above $325. Of the twelve colleges charging $125 or less, all are listed among Class A (acceptable) colleges [3] by the Council on Medical Education. Among these are the schools of medicine of several state universities for residents of those states. In contrast, all six of the colleges listed by the Council in Class C charge fees of $175 to $300 per year even though the diplomas from these colleges are reported as not recognized by from forty-two to forty-seven state licensing boards.[4] Although 47 colleges listed in Class A charge fees higher than $175 per year for each student, the actual expense for teaching that student for the year in these colleges is three or more times as large as the fee charged—made possible because of either state aid or private endowment. No medical college can properly teach modern medicine on the income received from fees alone. As the cost of conducting medical schools has increased, there has also been an increase—but less marked—in the fees charged for tuition. A large provision has already been made for scholarships and loan funds (see page 518) for the benefit of deserving students who are financially poor. Nevertheless, a much more generous provision for such students should be made. This is important since the medical curriculum in recent years has been so severe as to make it difficult or impossible for students to earn money during their attendance at medical school. A mere lack of funds should not prevent these students from becoming physicians.

TABLE 9.—*College Fees*

Total Fees	Number of Colleges			
	Class A	Class B	Class C	Total
$ 75 or less	6	..	..	6
75 to 125	6	..	..	6
125 to 175	8	1	1	10
175 to 225	15	1	4	20
225 to 275	14	..	..	14
275 to 325	14	..	1	15
Above 325	7	1	..	8
Totals	70	3	6	79

COLLEGES, STUDENTS AND GRADUATES BY STATES

For the last seven years New York has had eight medical colleges (Table 10)—the largest number—all but one of which are in Class A. Missouri and Pennsylvania have six colleges each and Illinois and Massachusetts have five each. Of Class C colleges, however, Missouri has three, Massachusetts has two and Illinois one. These Class C colleges exist because the licensing boards in certain states do not have or do not exert the power to refuse to examine their graduates.[4] This year New York had the largest number of students enrolled —2,075, followed by Illinois with 1,913 and Pennsylvania with 1,783 and Massachusetts with 1,352. New

3. See classification in Table 1, pages 510, 511.
4. See J. A. M. A. 80: 1352 (April 26) 1924, Table D.

(Continued on page 516)

Marginal Number	NAME OF COLLEGE	1 Alabama 242	2 Arizona 14	3 Arkansas 118	4 California 606	5 Colorado 153	6 Connecticut 287	7 Delaware 16	8 Dist. of Columbia 166	9 Florida 63	10 Georgia 305	11 Idaho 34	12 Illinois 1,306	13 Indiana 500	14 Iowa 550	15 Kansas 255	16 Kentucky 248	17 Louisiana 188	18 Maine 98	19 Maryland 234	20 Massachusetts 773	Marginal Number
1	University of Alabama School of Medicine	57	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	1	....	....	....	1
2	University of Arkansas Medical Department	1	....	54	2	....	1	....	1	....	1	....	....	1	1	4	1	1	....	....	1	2
3	College of Medical Evangelists	....	3	....	76	9	....	....	9	1	1	3	6	1	....	4	....	....	1	....	3	3
4	Stanford University School of Medicine	....	1	....	126	....	....	....	....	....	....	3	....	1	....	....	....	....	....	....	....	4
5	University of California Medical School	....	....	....	202	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	5
6	University of Colorado School of Medicine	....	....	....	1	83	....	....	....	....	....	2	2	2	2	4	....	....	....	1	1	6
7	Yale University School of Medicine	....	....	....	4	....	103	....	1	....	....	....	2	....	....	1	....	....	6	3	5	7
8	Georgetown University School of Medicine	....	....	....	....	....	18	....	22	....	1	....	....	....	....	....	....	....	1	2	14	8
9	George Washington University Medical School	....	....	....	1	1	4	1	58	....	....	1	2	....	....	3	1	....	....	12	2	9
10	Howard University School of Medicine	5	....	3	1	....	4	1	40	9	5	....	3	1	1	3	9	6	....	7	3	10
11	Emory University School of Medicine	43	....	1	1	....	....	....	1	17	132	....	....	....	....	....	1	1	....	....	....	11
12	University of Georgia Medical Department	1	....	....	....	....	....	....	....	1	102	....	....	....	....	....	2	....	....	....	2	12
13	Chicago Medical School	....	....	....	....	....	....	....	....	....	....	....	137	....	....	....	....	....	....	....	....	13
14	General Medical College	....	....	....	1	....	2	....	....	....	....	....	55	5	2	....	1	....	....	....	....	14
15	Loyola University School of Medicine	....	....	....	2	....	1	....	....	....	....	....	193	6	14	3	2	....	....	....	....	15
16	Northwestern University Medical School	....	2	1	19	11	1	....	1	....	....	4	152	21	19	10	3	2	1	....	2	16
17	Rush Medical College (University of Chicago)	6	1	3	9	5	1	....	1	1	2	4	229	31	28	14	6	....	2	1	....	17
18	University of Illinois College of Medicine	1	3	....	6	1	....	....	....	1	....	....	332	9	8	2	1	....	....	....	....	18
19	Indiana University School of Medicine	....	....	....	2	....	....	....	....	....	....	....	5	300	1	....	6	....	....	....	....	19
20	State University of Iowa College of Medicine	....	....	....	1	....	....	....	....	....	....	....	3	....	328	....	....	....	....	....	....	20
21	University of Kansas School of Medicine	....	1	....	....	1	....	....	....	....	....	....	1	....	1	115	....	....	....	....	....	21
22	University of Louisville Medical Department	2	....	....	5	....	....	....	....	1	1	....	6	30	1	3	128	....	1	....	....	22
23	Tulane University of Louisiana School of Medicine	49	1	14	7	1	5	....	....	11	5	....	3	1	1	2	4	121	....	1	....	23
24	Johns Hopkins University Medical Department	8	....	3	9	2	7	2	7	5	10	1	8	5	2	2	6	1	2	68	6	24
25	Univ. of Maryland Sch. of Med. and Coll. of P. & S.	1	....	....	....	....	8	....	1	1	....	....	....	....	....	....	3	....	....	105	....	25
26	Boston University School of Medicine	....	....	....	1	....	9	....	....	....	1	....	....	1	1	....	1	....	19	1	60	26
27	College of Physicians and Surgeons, Boston *	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	26	27
28	Harvard University Medical School	6	1	....	26	5	15	....	1	3	7	1	7	4	6	4	3	....	26	4	127	28
29	Tufts College Medical School	2	....	....	....	....	37	1	....	....	....	....	1	....	....	....	....	....	16	....	339	29
30	Middlesex College of Medicine and Surgery.—N.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	117	30
31	University of Michigan Medical School	1	....	....	8	1	....	....	2	1	2	1	10	27	2	....	3	....	....	1	4	31
32	Detroit College of Medicine and Surgery	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	32
33	University of Minnesota Medical School	....	....	....	1	3	1	....	....	....	....	....	7	2	26	2	1	....	....	1	....	33
34	University of Mississippi School of Medicine	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	3	....	....	....	....	34
35	University of Missouri School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	35
36	Kansas City College of Medicine and Surgery.—N.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	36
37	Kansas City University of Physicians and Surg.—N.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	37
38	St. Louis College of Physicians and Surgeons *	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	38
39	St. Louis University School of Medicine	1	1	1	22	2	1	....	1	....	....	1	56	10	22	20	1	5	....	1	3	39
40	Washington University School of Medicine	1	....	8	12	4	....	....	1	1	1	3	41	3	6	20	2	1	....	....	....	40
41	Creighton University College of Medicine	....	....	....	3	6	....	....	....	....	....	3	3	1	27	7	....	....	....	....	....	41
42	University of Nebraska College of Medicine	....	....	2	2	8	1	....	....	....	....	....	1	....	16	9	....	....	....	....	....	42
43	Dartmouth Medical School	....	....	....	1	....	5	....	....	....	....	....	1	....	....	....	....	....	2	....	8	43
44	Albany Medical College	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	44
45	University of Buffalo Medical Department	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	45
46	Columbia University College of Physicians and Surg.	1	....	....	5	3	11	....	....	1	....	....	....	2	2	3	1	....	1	....	6	46
47	Cornell University Medical College	....	....	....	9	....	5	....	....	1	....	....	1	2	....	2	1	....	1	....	7	47
48	Long Island College Hospital	....	....	....	....	....	8	....	....	....	....	....	....	....	....	....	....	....	1	....	2	48
49	New York Homeo. Med. Coll. and Flower Hosp.—H.	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	49
50	University and Bellevue Hospital Medical College	....	....	1	1	....	7	....	....	....	....	....	....	....	1	....	....	....	2	....	2	50
51	Syracuse University College of Medicine	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	5	51
52	University of North Carolina School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	52
53	Wake Forest College School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	53
54	University of North Dakota School of Medicine	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	54
55	Eclectic Medical College, Cincinnati.—E.	....	....	....	....	....	....	....	....	....	1	....	2	10	....	2	12	....	....	1	....	55
56	University of Cincinnati College of Medicine	2	....	....	3	....	....	....	....	....	....	....	....	6	1	3	14	....	....	....	....	56
57	Western Reserve University School of Medicine	....	....	....	2	....	....	....	....	2	....	....	1	3	....	3	....	....	2	....	1	57
58	Ohio State University College of Medicine	....	....	....	1	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	1	58
59	University of Oklahoma School of Medicine	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	59
60	University of Oregon Medical School	....	....	....	9	1	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	60
61	Hahnemann Med. Coll. and Hosp. of Philadelphia.—H.	....	....	....	3	1	1	3	1	....	....	1	1	....	2	....	2	....	....	....	2	61
62	Jefferson Medical College of Philadelphia	4	....	1	3	1	12	6	5	3	3	1	5	3	3	2	....	....	2	10	8	62
63	Temple University School of Medicine	....	....	....	....	....	1	....	1	....	....	....	....	1	....	....	....	....	....	1	2	63
64	University of Pennsylvania School of Medicine	4	....	....	8	1	1	1	1	1	4	....	3	1	6	2	1	1	3	4	4	64
65	Woman's Medical College of Pennsylvania	....	....	1	3	....	1	....	1	....	1	....	....	....	2	....	....	....	....	2	....	65
66	University of Pittsburgh School of Medicine	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	66
67	Medical College of the State of South Carolina	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	67
68	University of South Dakota College of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	68
69	University of Tennessee College of Medicine	12	....	9	....	1	....	....	2	3	5	....	5	1	....	2	5	5	....	1	....	69
70	Meharry Medical College	8	....	8	1	....	1	....	2	7	19	....	6	2	....	....	1	....	....	1	1	70
71	Vanderbilt University School of Medicine	23	....	5	1	....	1	....	....	3	....	....	....	5	1	1	18	1	....	....	....	71
72	Baylor University College of Medicine	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	6	....	....	....	72
73	University of Texas School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	73
74	University of Utah School of Medicine	....	....	....	1	1	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	74
75	University of Vermont College of Medicine	....	....	....	1	....	9	....	....	....	....	....	....	....	....	....	....	....	8	....	7	75
76	Medical College of Virginia	....	....	1	....	....	1	....	2	2	....	....	....	....	....	....	2	1	....	5	....	76
77	University of Virginia Department of Medicine	1	....	....	....	....	1	1	3	4	....	....	....	....	....	....	2	2	....	....	1	77
78	West Virginia University School of Medicine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	78
79	University of Wisconsin Medical School	....	....	....	....	....	....	....	....	....	....	....	7	....	3	1	1	....	....	....	....	79
80	Marquette University School of Medicine	1	....	....	....	....	....	....	....	....	....	....	8	....	8	....	2	....	....	....	....	80
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

* Figures and distribution are approximate. E.—Eclectic; H.—Homeopathic; N.—Nondescript.

MEDICAL STUDENTS BY STATES

Marginal Number	21 Michigan.....648	22 Minnesota.....380	23 Mississippi.....167	24 Missouri.....542	25 Montana.....49	26 Nebraska.....361	27 Nevada.....4	28 New Hampshire...50	29 New Jersey.....493	30 New Mexico.....13	31 New York.....2,500	32 North Carolina...370	33 North Dakota.....93	34 Ohio.....908	35 Oklahoma.....204	36 Oregon.....181	37 Pennsylvania...1,305	38 Rhode Island.....96	39 South Carolina...224	40 South Dakota...101	41 Tennessee.....252	42 Texas.....600	43 Utah.....129	44 Vermont.....95	45 Virginia.....619	46 Washington.....149	47 West Virginia...307	48 Wisconsin.....493	49 Wyoming.....10	50 Philippines, etc...100	51 Foreign.....302	Totals.....17,728	Marginal Number
1	....	....	5	....	....	1	....	....	....	....	1	1	1	1	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	3	70	1
2	1	1	....	3	....	....	....	....	3	....	26	1	....	....	1	....	....	1	....	....	....	7	3	....	2	1	16	....	....	....	4	23	114	2
3	13	5	1	....	1	10	1	....	1	....	3	1	2	4	2	6	3	....	....	....	....	1	....	2	....	2	2	1	....	....	2	2	223	3
4	....	1	....	1	....	....	2	....	1	....	....	....	....	1	....	3	1	....	....	....	....	....	....	....	....	1	2	1	....	....	....	....	149	4
5	....	....	....	....	....	2	....	....	....	1	....	....	....	2	....	....	....	1	....	....	....	1	1	....	1	1	1	1	1	1	2	....	211	5
6	....	3	....	3	....	....	....	1	5	....	32	1	....	7	....	1	6	1	2	....	....	1	1	2	....	1	1	1	1	6	7	....	118	6
7	1	....	....	1	....	....	....	....	29	....	45	2	....	3	....	....	28	13	....	....	1	1	....	1	12	....	3	1	....	....	8	....	196	7
8	1	2	....	....	3	....	....	1	23	....	69	5	1	2	1	....	15	1	1	2	1	....	5	....	33	....	2	....	....	2	20	....	197	8
9	....	1	....	1	....	....	....	....	8	....	18	15	....	5	2	....	10	1	7	1	2	5	2	....	8	....	....	....	....	....	1	....	238	9
10	3	....	2	1	....	....	....	....	....	....	1	7	....	1	....	....	1	....	2	....	4	2	....	....	1	....	....	1	....	4	....	....	226	10
11	....	....	2	1	....	....	....	....	....	1	2	2	....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	1	....	....	....	....	222	11
12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	125	12
13	....	....	....	....	....	....	....	....	2	....	17	....	....	4	....	....	2	1	....	....	....	1	....	....	1	....	....	6	....	1	9	5	137	13
14	3	....	....	....	....	....	....	....	....	....	9	4	....	5	1	2	5	....	1	....	....	1	....	....	1	1	3	6	....	3	5	5	103	14
15	11	5	....	....	1	6	5	....	....	1	4	....	4	14	7	2	10	....	1	6	1	3	3	1	1	21	13	2	41	1	2	11	289	15
16	10	16	4	8	6	2	7	....	....	2	4	2	12	14	4	5	5	1	1	8	5	8	7	1	....	....	....	....	14	....	3	15	423	16
17	10	7	2	10	2	1	....	....	....	1	6	....	9	4	....	....	5	1	....	1	8	....	3	....	....	....	....	....	2	....	2	1	533	17
18	6	4	....	2	....	....	....	....	....	1	6	....	5	4	1	....	4	....	....	....	....	....	....	....	....	....	....	....	2	....	2	3	428	18
19	3	2	....	....	....	....	....	....	....	2	3	....	....	2	10	....	....	....	....	....	6	....	1	....	....	....	....	....	....	....	....	4	346	19
20	....	11	....	....	....	....	1	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	365	20
21	....	....	....	11	....	....	....	....	....	....	1	1	....	20	4	2	....	....	....	....	....	1	3	4	1	5	1	9	2	....	1	2	137	21
22	....	1	1	4	....	....	....	....	....	....	9	2	....	....	7	....	2	....	2	....	....	6	38	1	....	1	15	2	1	1	....	9	250	22
23	....	....	37	3	....	....	....	....	4	....	11	11	1	....	1	5	21	4	2	....	....	4	13	2	1	1	3	2	5	18	4	2	362	23
24	3	2	2	5	....	....	....	....	7	....	20	11	7	1	....	....	36	4	9	2	....	....	....	3	1	1	1	1	1	1	....	1	307	24
25	....	....	....	....	....	2	....	....	1	....	64	31	....	6	....	1	3	4	2	....	....	....	....	....	....	....	1	....	1	....	5	9	340	25
26	....	....	....	....	....	....	....	....	8	5	69	....	....	2	....	1	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	208	26
27	....	....	....	....	....	8	....	5	8	....	57	2	1	24	6	8	27	17	3	3	2	8	2	3	3	6	3	6	1	1	24	26	27
28	5	3	2	10	....	....	....	13	7	....	56	....	....	1	....	....	1	23	....	....	....	....	....	....	1	1	....	....	....	1	1	6	494	28
29	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19	507	29
30	....	....	....	4	3	4	....	2	8	....	38	3	2	57	2	1	25	2	....	1	2	....	1	2	3	5	1	4	....	....	1	1	117	30
31	341	4	....	....	4	3	4	....	....	....	1	....	....	2	....	....	2	....	1	19	....	....	....	4	....	....	1	5	....	1	....	2	23	597	31
32	183	....	....	....	....	....	....	1	1	....	3	....	....	13	3	....	2	....	....	....	....	....	2	....	....	....	....	33	....	....	....	....	191	32
33	8	236	....	....	1	6	3	....	....	....	1	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	411	33
34	....	....	....	56	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	68	34
35	....	....	....	....	70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	77	35
36	....	....	....	....	17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17	36
37	....	....	....	....	54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	54	37
38	....	....	....	....	19	....	....	....	....	2	1	15	....	1	3	62	2	1	2	1	1	2	1	4	4	2	....	1	11	....	4	2	19	38
39	8	15	1	137	6	....	....	....	....	....	1	2	2	3	1	2	6	2	1	1	1	1	1	4	6	3	....	1	12	....	1	2	432	39
40	....	5	3	123	1	....	....	....	....	....	....	....	....	1	....	2	1	2	....	....	....	7	....	....	....	....	3	....	2	2	4	1	2	291	40
41	....	14	....	5	11	63	....	....	....	....	2	....	....	2	....	....	....	....	....	....	....	9	....	....	....	....	....	....	....	....	5	1	....	164	41
42	....	7	....	5	1	245	....	....	4	8	7	....	....	1	....	....	3	....	1	....	....	....	....	....	4	....	....	....	....	....	....	....	321	42
43	....	....	....	....	....	....	....	....	....	3	81	....	....	....	....	....	....	8	....	....	....	....	....	....	....	....	....	....	....	....	....	1	44	43
44	....	1	....	1	....	....	....	....	2	2	220	....	....	6	....	....	3	3	1	....	3	1	1	6	....	2	1	3	2	....	1	3	89	44
45	....	....	....	....	....	....	....	....	2	1	249	1	....	6	....	1	....	3	5	2	....	1	1	....	2	1	1	1	2	....	1	10	244	45
46	1	....	3	1	....	1	1	1	1	41	135	3	....	6	....	....	....	3	1	....	1	....	1	....	2	1	1	1	2	....	2	4	377	46
47	....	....	....	....	....	....	1	....	1	28	331	....	....	....	....	....	....	3	2	....	....	....	....	....	1	....	....	....	....	....	....	....	230	47
48	....	....	....	....	....	....	....	....	....	8	165	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	357	48
49	....	....	....	....	2	....	1	....	....	63	332	....	....	....	....	....	....	6	....	....	....	....	....	5	....	1	....	2	....	....	....	2	169	49
50	....	....	....	....	....	....	....	....	....	8	150	4	....	1	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	3	6	428	50
51	....	....	....	....	....	....	....	....	....	....	....	64	....	1	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	181	51
52	....	....	....	....	....	....	....	....	....	3	2	45	....	....	....	....	....	1	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	69	52
53	....	....	....	....	....	....	....	....	....	....	2	....	29	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	63	53
54	....	....	....	....	....	1	....	....	....	7	39	....	....	34	1	....	....	6	....	....	....	....	....	2	....	....	....	3	....	....	....	....	....	36	54
55	....	2	....	4	....	1	....	....	....	1	4	....	8	162	....	1	....	9	....	....	....	4	1	....	1	....	....	2	10	....	2	2	2	127	55
56	....	2	....	....	....	....	....	....	....	1	5	....	....	138	....	....	....	17	....	....	....	....	....	....	1	....	....	3	....	....	....	2	3	237	56
57	3	....	....	1	....	1	....	1	....	1	1	1	1	264	....	....	....	4	....	....	....	....	1	5	....	....	....	2	....	....	1	....	191	57
58	....	....	....	1	....	....	....	....	....	1	1	....	....	....	....	134	....	....	....	....	....	....	....	....	1	....	....	40	....	....	3	....	1	280	58
59	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	121	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	148	59
60	....	....	....	....	....	3	....	....	....	....	5	....	....	6	....	....	....	134	2	....	....	....	....	....	....	....	....	1	1	1	....	4	193	60
61	1	1	....	....	....	....	....	1	36	38	1	27	28	1	28	....	4	306	5	4	2	3	1	8	1	2	3	22	2	....	8	9	210	61
62	2	4	....	8	....	3	....	1	17	....	....	6	2	2	....	....	144	....	....	....	8	9	15	....	7	11	5	1	16	1	2	5	593	62
63	1	....	....	....	....	....	....	....	22	....	....	20	38	2	6	1	256	1	2	....	1	....	....	....	2	2	....	....	1	....	....	3	184	63
64	4	3	7	13	1	4	....	1	12	....	....	20	6	....	3	1	41	....	3	....	1	....	....	1	....	....	....	....	....	....	....	4	474	64
65	2	....	....	1	....	....	....	....	1	....	1	1	....	....	11	....	195	....	....	123	....	....	....	1	....	1	....	....	....	....	....	....	....	110	65
66	....	1	....	....	....	....	....	....	....	....	2	2	6	....	....	....	....	....	....	....	....	22	....	....	....	....	1	....	....	....	....	....	....	212	66
67	....	....	....	....	....	....	1	....	....	....	6	....	....	1	....	1	....	....	....	....	....	....	92	18	....	....	6	....	4	....	....	....	1	147	67
68	....	1	....	....	....	....	....	....	5	1	5	2	....	....	6	....	....	2	....	15	....	....	9	19	....	....	12	....	1	....	....	....	1	36	68
69	3	....	14	1	....	....	....	....	5	1	5	12	....	9	2	....	2	....	....	3	....	....	88	18	....	....	1	....	1	....	....	....	1	209	69
70	4	....	7	6	....	....	....	....	....	....	3	3	....	1	1	....	2	....	....	....	....	....	....	175	1	....	....	....	....	....	....	....	11	172	70
71	....	....	5	3	....	....	....	....	....	....	3	1	....	....	2	....	....	....	....	....	....	....	....	256	....	....	....	....	....	....	....	....	2	192	71
72	1	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	41	....	....	....	....	....	....	....	....	201	72
73	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	72	....	....	....	....	....	....	....	256	73
74	....	....	....	....	....	....	....	....	....	....	....	16	....	....	....	....	1	5	2	....	....	....	....	....	....	....	170	....	32	....	....	5	1	46	74
75	....	....	....	....	....	....	....	....	8	2	....	27	38	....	5	....	5	2	1	....	....	....	....	....	....	....	115	1	1	....	....	1	1	126	75
76	....	....	....	1	....	....	....	....	....	2	....	12	13	....	1	2	....	4	....	11	....	4	....	....	....	....	....	....	65	....	....	4	....	303	76
77	1	....	7	....	....	....	....	....	....	5	....	10	1	....	4	....	20	....	....	....	....	....	....	....	....	....	....	....	....	183	....	....	....	198	77
78	....	....	....	....	....	....	....	....	....	2	....	3	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	158	....	3	1	103	78
79	4	2	....	....	....	....	....	....	....	1	....	8	....	2	3	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	157	79
80	16	17	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	225	80
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51			

(Continued from page 513)

York leads also in the number of graduates, having reported 441, followed by Pennsylvania with 405, Illinois with 383, Massachusetts with 340 and Missouri with 217.

TABLE 10.—*Medical Colleges, Students and Graduates by States*

State	Colleges		Students		Graduates		Graduates with B.S. or A.B.
	Class A and B	Class C	Men	Women	Men	Women	
Alabama	1	..	69	1	...	..	...
Arkansas	1	..	113	1	10	..	7
California	3	..	497	86	104	22	115
Colorado	1	..	102	16	14	4	5
Connecticut	1	..	187	9	43	1	34
Dist. of Columbia	3	..	655	16	86	4	43
Georgia	2	..	343	4	88	..	60
Illinois	4	1	1,810	103	368	15	272
Indiana	1	..	330	16	67	3	69
Iowa	1	..	358	7	49	..	32
Kansas	1	..	120	17	23	..	15
Kentucky	1	..	243	7	46	2	20
Louisiana	1	..	249	13	80	4	44
Maryland	2	..	600	47	142	16	100
Massachusetts	3	2	1,298	54	328	12	141
Michigan	2	..	751	37	152	11	68
Minnesota	1	..	379	32	56	2	58
Mississippi	1	..	66	2	...	..	...
Missouri	3	3	873	17	212	5	131
Nebraska	2	..	465	20	87	3	81
New Hampshire	1	..	44	..	...	..	...
New York	8	..	1,907	168	309	42	202
North Carolina	2	..	132	..	...	..	...
North Dakota	1	..	35	1	...	..	...
Ohio	4	..	808	32	171	8	113
Oklahoma	1	..	141	7	21	..	20
Oregon	1	..	180	13	38	3	20
Pennsylvania	6	..	1,627	156	361	44	182
South Carolina	1	..	144	3	28	..	13
South Dakota	1	..	35	1	...	..	...
Tennessee	3	..	568	5	132	2	52
Texas	2	..	437	20	85	4	38
Utah	1	..	46	..	...	..	...
Vermont	1	..	120	6	32	1	10
Virginia	2	..	481	15	98	6	47
West Virginia	1	..	104	2	...	..	...
Wisconsin	2	..	302	20	28	..	28
Totals	73	6	16,774	954	3,348	214	2,020

QUALIFICATIONS OF STUDENTS AND GRADUATES

Table 11 shows the students and graduates of the last twelve years grouped according to their classification by the Council on Medical Education and Hospitals. During this time the percentage of students enrolled in Class A colleges has increased from 65.4 to 94.7 and, since 1917, the total number of students in attendance at these schools has increased from 11,317 to

TABLE 11.—*Students and Graduates According to Classification*

Year	Students						Graduates					
	Colleges Rated in Class						Colleges Rated in Class					
	A	%	B	%	C	%	A	%	B	%	C	%
1913	11,122	65.4	4,158	24.4	1,735	10.2	2,589	63.8	1,050	26.4	392	9.8
1914	12,336	74.7	2,838	17.2	1,328	8.1	2,626	73.1	686	19.1	282	7.8
1915	11,314	76.0	2,668	17.9	909	6.1	2,629	74.4	688	19.4	219	6.2
1916	11,162	79.6	2,087	14.9	773	5.5	2,630	74.7	695	19.8	198	5.5
1917	11,317	82.2	1,761	12.8	686	5.0	2,577	76.3	648	19.2	154	4.5
1918	11,522	84.5	1,488	10.9	620	4.5	2,024	75.8	399	14.9	247	9.2
1919	11,344	87.7	1,086	8.4	500	3.9	2,220	88.0	268	10.1	168	6.3
1920	12,320	89.2	680	4.8	798	6.0	2,690	88.4	152	5.0	205	6.6
1921	13,061	90.4	832	6.4	553	3.9	2,812	88.1	200	6.3	180	5.6
1922	14,120	90.3	852	5.5	663	4.2	2,204	87.1	143	5.7	182	7.2
1923	15,982	94.2	522	3.1	456	2.7	2,881	91.7	83	2.9	156	5.4
1924	16,775	94.7	583	3.3	370	2.0	3,343	93.8	115	3.2	104	3.0

16,775. Both the numbers and the percentages of students enrolled in Class B and Class C colleges have been reduced. The percentage of students in Class B colleges has dropped from 24.4 to 3.1 and in Class C colleges from 10.2 to 2.0. Of graduates, also, the percentage in Class A colleges has increased while it has decreased in Class B and Class C colleges. Such reductions as there have been in the total numbers of students and graduates, therefore, have been at the expense of the lower grade colleges. These figures show decidedly a "survival of the fittest."

COLLEGES CLOSED SINCE 1904

Since 1904 when the campaign for the improvement of medical education was begun, as shown in Table 12, altogether 117 colleges have ceased to exist but, during the same time, 36 new colleges (including three which were reestablished) were organized, making a net reduction of 81. Of the colleges which ceased to exist, 57 were through a merger with other institutions and 58 became extinct. Of the 57 which merged, 48 were Class A and Class B medical schools, but of the 58 colleges which became extinct, 44 were rated in Class C. It will be seen, therefore, that the better grade schools

TABLE 12.—*Colleges Closed Since 1904*

Year	Class A		Class B		Class C		Totals		Total Closed	New Colleges				Total Existing Colleges
	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.	Mgd.	Ext.		Class A	Class B	Class C	Total	
1905	8	1	..	..	..	..	8	1	9	7	..	..	7	158
1906	..	..	..	..	..	..	..	..	..	4	..	..	4	162
1907	3	..	3	1	..	3	6	4	10	3	1	3	7	159
1908	2	..	2	..	1	4	5	4	9	2	..	2	4	154
1909	3	..	2	..	..	7	5	7	12	..	..	..	..	142
1910	1	..	2	..	3	6	7	6	13	..	..	2	2	131
1911	2	1	3	..	1	4	5	4	9	..	..	..	..	122
1912	1	..	1	..	1	3	4	3	7	1*	1*	1	3	118
1913	3	..	6	1	1	3	10	4	14	1*	1	1	3	107
1914	..	..	..	..	2	3	2	3	5	..	..	..	..	102
1915	1	..	1	2	1	2	3	4	7	..	1	..	1	96
1916	1	..	..	..	..	1	1	1	2	..	..	1	1	95
1917	..	..	..	..	..	1	..	1	..	..	..	2	2	96
1918	..	..	1	2	..	5	1	7	8	..	..	2	2	90
1919	..	1	..	1	..	2	..	4	4	..	..	..	..	86
1920	..	..	..	1	..	..	..	1	1	..	..	..	..	85
1921	..	2	..	..	..	..	..	2	2	..	..	..	..	83
1922	1	..	1	..	..	..	2	..	2	..	..	..	..	81
1923	..	..	..	..	..	1	..	1	1	..	..	..	..	80
1924	..	..	..	1	..	..	..	1	1	..	..	..	..	79
Totals	26	5	22	9	9	44	57	58	117	18	4	14	36	79

* Reestablished.

are still existing as parts of other institutions which were greatly strengthened by the mergers. On the other hand, the schools which were closed outright were mostly those which were unworthy of consideration.

Of the 36 new institutions established, 18 were Class A institutions, including several formed by the merger of two or more other medical schools. All but three of the new Class B and Class C schools have since become extinct. The largest number of schools becoming extinct in any one year was 14 in 1913, of which 10 were by merger. The eight year period from 1905 to 1913 represents the great transition period in medical teaching institutions in the United States.

HINTS TO PROSPECTIVE MEDICAL STUDENTS

The student who is contemplating the study of medicine should note with care the character and classification of the medical school in which he is planning to enroll.[5] The selection of the school in which he is to obtain his medical training is a matter of extreme importance and should be considered with special care. He should note the standards for admission, which will

5. For useful information regarding all medical schools, a pamphlet entitled "Choice of a Medical School" will be sent to any address on receipt of 10 cents.—ED.

TABLE 3.—*Medical Students Shown by Classes*

NAME OF COLLEGE	Enrolled During 1923-24				
	1st Year	2d Year	3d Year	4th Year	Totals
University of Alabama School of Med.*...	34	36	..	..	70
University of Arkansas Medical Dept.....	45	35	24	10	114
College of Medical Evangelists.....	44	51	70	58	223
Stanford University School of Medicine...	54	37	29	29	149
University of California Medical School....	62	53	48	48	211
University of Colorado School of Med.....	38	32	29	19	118
Yale University School of Medicine.....	53	54	47	42	196
Georgetown University School of Med.....	67	54	42	34	197
George Washington University Med. School	87	66	50	35	238
Howard University School of Medicine.....	49	55	94	38	236
Emory University School of Medicine.....	56	48	61	57	222
University of Georgia Medical Dept.....	38	28	28	31	125
Chicago Medical School.....	30	48	36	23	137
General Medical College.....	11	23	25	44	103
Loyola University School of Medicine.....	93	72	71	53	289
Northwestern University Medical School....	115	87	113	108	423
Rush Medical College (Univ. of Chicago)..	98	96	197	142	533
University of Illinois College of Medicine..	101	110	112	105	428
Indiana University School of Medicine.....	105	79	92	70	346
State University of Iowa College of Med...	128	92	96	49	365
University of Kansas School of Medicine...	40	43	34	20	137
University of Louisville Medical Dept.....	75	61	66	48	250
Tulane Univ. of Louisiana School of Med..	105	77	96	84	362
Johns Hopkins University Medical Dept....	79	66	81	81	307
University of Maryland School of Medicine and College of Physicians and Surgeons..	98	80	84	78	340
Boston University School of Medicine.....	63	50	48	47	208
College of Physicians and Surgs., Boston†.	8	5	6	7	26
Harvard University Medical School.....	125	120	123	126	494
Tufts College Medical School.....	153	113	104	137	507
Middlesex College of Med. and Surg.—N..	26	18	45	28	117
University of Michigan Medical School.....	164	136	161	136	597
Detroit College of Medicine and Surgery....	62	51	52	26	191
University of Minnesota Medical School....	102	102	103	104	411
University of Mississippi School of Med.*..	39	29	...	...	68
University of Missouri School of Med.*.....	43	34	...	...	77
Kansas City College of Med. and Surg.—N.#	...	...	...	17	17
Kansas City Univ. of Phys. & Surgs.—N.‡.	10	8	15	21	54
St. Louis College of Phys. and Surgs.‡....	...	6	5	8	19
St. Louis University School of Medicine....	131	106	99	96	432
Washington University School of Medicine.	77	60	75	79	291
Creighton University College of Medicine...	54	36	36	38	164
University of Nebraska College of Medicine.	84	79	80	60	321
Dartmouth Medical School*.....	21	23	..	..	44
Albany Medical College.....	32	21	17	19	89
University of Buffalo Medical Dept.....	76	56	49	63	244
Columbia Univ. College of Phys. & Surgs.	104	89	96	88	377
Cornell University Medical College.....	46	68	58	58	230
Long Island College Hospital.....	109	97	94	57	357
New York Homeopathic Medical College and Flower Hospital.—H.....	51	51	33	34	169
University and Bellevue Hosp. Med. College	127	94	102	105	428
Syracuse University College of Medicine..	52	45	46	38	181
Univ. of N. Carolina School of Med.*.....	37	32	...	...	69
Wake Forest College School of Medicine*.	35	28	...	...	63
University of N. Dakota School of Med.*.	23	13	...	...	36
Eclectic Medical College, Cincinnati.—E....	35	35	30	27	127
University of Cincinnati College of Med.‡.	58	58	57	64	237
Western Reserve University School of Med.	56	49	44	42	191
Ohio State University College of Medicine..	62	75	90	53	280
University of Oklahoma School of Med....	50	46	31	21	148
University of Oregon Medical School.....	54	49	49	41	193
Hahnemann Medical College and Hospital of Philadelphia.—H.....	67	45	51	47	210
Jefferson Medical College of Philadelphia..	168	134	146	145	593
Temple University School of Medicine.....	60	60	47	17	184
Univ. of Pennsylvania School of Med....	108	97	137	132	474
Woman's Medical College of Pa.....	20	26	31	33	110
University of Pittsburgh School of Med...	75	52	49	36	212
Medical College of the State of South Carolina	42	36	40	29	147
Univ. of South Dakota College of Med...	18	18	...	...	36
Univ. of Tennessee Coll. of Medicine.....	62	44	56	47	209
Meharry Medical College.....	52	48	31	41	172
Vanderbilt University School of Medicine.	46	54	43	49	192
Baylor University College of Medicine.....	98	47	37	19	201
University of Texas School of Medicine....	64	63	59	70	256
University of Utah School of Medicine*..	26	20	...	...	46
University of Vermont College of Med....	25	25	42	34	126
Medical College of Virginia.....	84	74	70	75	303
Univ. of Virginia Department of Med....	55	53	55	30	193
West Virginia University School of Med.*..	58	48	...	...	106
University of Wisconsin Medical School *..	90	67	...	...	157
Marquette University School of Medicine..	68	65	54	38	225
Totals for 1924.....	5,160	4,441	4,330	3,797	17,728
Totals for 1923.....	5,162	4,615	3,861	3,322	16,960
Totals for 1922.....	5,412	4,219	3,355	2,649	15,635

E.—Eclectic; H.—Homeopathic; N.—Nondescript.
* Gives only the first two years of the medical course.
† Figures and distribution are approximate.
# The only report received regarding students in this school includes names of 17, all of whom were said to have received degrees.
‡ Figures exact; distribution approximate.

be found in the descriptive statements of the colleges appearing on pages 521 to 530. A careful review of the material published this week will be of great service to such students.

GRADUATE MEDICAL EDUCATION

The facilities for graduate medical instruction in the United States are set forth on the next few pages. There is not only a list of approved graduate medical schools published alphabetically but also there is a series of subjects showing under each the institutions in which approved courses of instruction are being offered. Although this list of subjects is not large, it is a beginning, and other subjects and institutions will be added as rapidly as they are investigated and found worthy of approval.

It is hoped that by the publication each year of these data, opportunities for advanced instruction in both graduate and undergraduate medical schools may be enlarged and that a constantly increasing use may be made of the abundance of clinical material in this country. The majority of undergraduate medical schools are now equal to those in other leading countries, but increased opportunities should be developed where physicians can secure high grade instruction in graduate medical work.

The Combined Course in Liberal Arts and Medicine

There are sixty-three medical schools which announce that arrangements have been made whereby students can secure degrees in boths arts and medicine in six or seven years' time. Many have arranged for the B.S. and M.D. degrees in six years, or the A.B. and M.D. degrees in seven years. Eleven of these colleges give only the first two years of the medical course and, therefore, offer only the first four or five years of the combined course. These are indicated by the figures four and five in parentheses. The list of medical schools follows:

College	B.S. and M.D.	A.B. and M.D.
University of Alabama School of Medicine.....	6 (4)	..
University of Arkansas Medical Department.....	6	..
College of Medical Evangelists.....	6	7
Stanford University School of Medicine.....	..	8[1]
University of California Medical School.....	8[1]	8[1]
University of Colorado School of Medicine.....	..	7
Yale University School of Medicine.....	7	..
Georgetown University School of Medicine.....	6	..
George Washington University Medical School....	6	7
Howard University School of Medicine.....	7	7
Emory University School of Medicine.....	7	..
University of Georgia Medical Department.....	7	..
General Medical College.....	6	..
Loyola University School of Medicine.....	7[1]	..
Northwestern University Medical School.....	7[1]	..
Rush Medical College.....	8[1]	..
University of Illinois College of Medicine.....	7[1]	8[1]
Indiana University School of Medicine.....	6	7
State University of Iowa College of Medicine.....	6	7
University of Kansas School of Medicine.....	6	7
University of Louisville Medical Department.....	6	..
Tulane University School of Medicine.....	6	..
Johns Hopkins University Medical Department...	..	7
University of Maryland School of Medicine.....	..	7
Boston University School of Medicine.....	6	..
Tufts College Medical School.....	..	7
University of Michigan Medical School.....	6	7
University of Minnesota Medical School.....	7[1]	8[1]
University of Mississippi.....	6 (4)	..
St. Louis University School of Medicine.....	6	..
University of Missouri School of Medicine.....	..	6 (4)
Washington University School of Medicine.....	6	..
Creighton University College of Medicine.....	6	..
University of Nebraska College of Medicine.....	6	7
Dartmouth Medical School.....	7 (5)	..
Albany Medical College.....	7	..
Columbia University College of Phys. and Surgs..	..	7

1. Eight medical schools require a hospital internship for the M.D., making a total of 7 or 8 years for the combined course.

Cornell University Medical College	..	7
Syracuse University College of Medicine	6	7
University and Bellevue Hospital Medical College	6	..
University of Buffalo Medical Department	6	7
University of North Carolina School of Medicine	7 (5)	..
Wake Forest College School of Medicine	6 (4)	..
University of North Dakota School of Medicine	6 (4)	7 (5)
Ohio State University College of Medicine	6	7
University of Cincinnati College of Medicine	6	7
Western Reserve University School of Medicine	7	7
University of Oklahoma School of Medicine	6	..
University of Oregon Medical School	..	7
Hahnemann Medical Coll. and Hosp., Philadelphia	6	..
University of Pennsylvania School of Medicine	..	7
University of Pittsburgh School of Medicine	7	..
University of South Dakota College of Medicine	6 (4)	7 (5)
University of Tennessee College of Medicine	6	7
Baylor University College of Medicine	..	6
University of Texas School of Medicine	6	7
University of Utah School of Medicine	7 (5)	..
University of Vermont College of Medicine	..	7
Medical College of Virginia	..	7
University of Virginia Department of Medicine	7	7
West Virginia University School of Medicine	6 (4)	..
Marquette University School of Medicine	7[1]	8[1]
University of Wisconsin Medical School	6 (4)	7 (5)

Scholarships in Medical Schools

As evidence that provision is being made for worthy students, regardless of their financial status, 534 scholarships are reported this year in the following forty-six medical schools:

University of Alabama School of Medicine, Tuscaloosa	67
Stanford University Medical School,* San Francisco	2
University of California Medical School,* San Francisco	6
University of Colorado School of Medicine,* Denver	1
Yale University School of Medicine,* New Haven	2
Georgetown University School of Medicine, Washington	2
Emory University Medical School,* Atlanta	11
Northwestern University School of Medicine,* Chicago	1
Rush Medical College, Chicago	7
University of Illinois College of Medicine, Chicago	84
Indiana University School of Medicine,* Bloomington and Indianapolis	12
State University of Iowa College of Medicine, Iowa City	1
University of Kansas School of Medicine,* Kansas City	1
Johns Hopkins University Medical Department, Baltimore	6
University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	8
Boston University School of Medicine,* Boston	16
Medical School of Harvard University,* Boston	50
Detroit College of Medicine and Surgery, Detroit	8
University of Missouri School of Medicine,* Columbia	10
Washington University School of Medicine, St. Louis	2
University of Nebraska College of Medicine,* Omaha	6
Dartmouth Medical School,* Hanover, N. H.	2
Albany Medical College, Albany, N. Y.	11
University of Buffalo Department of Medicine,* Buffalo	1
Columbia University College of Physicians and Surgeons, New York	70
Cornell University Medical College,* New York	3
Syracuse University College of Medicine, Syracuse	1
University and Bellevue Hospital Medical College,* New York	1
University of North Carolina School of Medicine, Chapel Hill	1
University of Cincinnati College of Medicine,* Cincinnati	12
University of Oregon Department of Medicine,* Portland	5
Hahnemann Medical College and Hospital of Philadelphia*	12
Jefferson Medical College, Philadelphia	3
Temple University Department of Medicine, Philadelphia	3
University of Pennsylvania School of Medicine,* Philadelphia	4
University of Pittsburgh School of Medicine, Pittsburgh	3
Woman's Medical College of Pennsylvania,* Philadelphia	30
Medical College of the State of South Carolina, Charleston	8
University of Tennessee College of Medicine, Memphis	15
Vanderbilt University Medical Department, Nashville, Tenn.	4
University of Texas Department of Medicine,* Galveston	2
University of Vermont Medical School*	55
Medical College of Virginia, Richmond	10
University of Virginia Department of Medicine,* Charlottesville	2
West Virginia University School of Medicine,* Morgantown	1
University of Wisconsin Medical School, Madison	6
Total in 46 medical schools	568

* Have loan funds also.

Loan Funds

Besides the twenty-five colleges marked by an asterisk (*) in the above list which have loan funds for deserving but needy students, such funds are available also at the six following medical schools:

Columbia University College of Phys. and Surgs., New York City.
College of Medical Evangelists, Loma Linda, Calif.
Tulane University of Louisiana School of Medicine, New Orleans.
University of Michigan Medical School, Ann Arbor.
Wake Forest College School of Medicine, Wake Forest, N. C.
University of North Dakota School of Medicine, University.

GRADUATE MEDICAL SCHOOLS

Principles Regarding Graduate or Postgraduate Medical Schools

The following principles were adopted by the House of Delegates in June, 1923, as a basis for the grading of graduate medical schools:

1. *Admission Requirements.*—The minimum admission requirement for those wishing to prepare themselves for the practice of a specialty should be graduation from an acceptable (Class A) medical college and completion of at least one year's internship in an approved hospital, or the experience gained by at least five years spent in the active practice of medicine. In the case of reputable physicians who desire to improve themselves for general practice, lenient admission requirements are justified. Courses for *general practitioners* should be open to all physicians who have received the degree of Bachelor or Doctor of Medicine from medical colleges considered acceptable by this Council, or to reputable physicians who were licensed in certain states before graduation was required.

2. *Records.*—Records should be kept by each institution showing (*a*) the preliminary and professional entrance qualifications of every student, which should be verified by authentic or documentary evidence; (*b*) previous attendance at graduate courses and grades obtained; (*c*) the subjects for which he is enrolled; (*d*) evidence of his faithful attendance at his work; (*e*) evidence of the student's proficiency as demonstrated by his routine or research work, examinations or otherwise, and (*f*) whether an advanced degree or certificate was granted.

Records, indeed, are just as essential in a graduate as in an undergraduate school. Graduate physicians, indeed, will vary more in their preliminary and professional qualifications than the present-day undergraduates, and a knowledge of these qualifications is essential to decide the character and grade of the work to which the graduate student should be assigned. Again, a knowledge of his proficiency in the work to which he is assigned is essential to know whether he is worthy of advancement, or whether he can be trusted with responsibility for the diagnosis and treatment of patients who may be assigned to his care. Especially are such records important for those preparing for the practice of a specialty.

3. *Supervision.*—There should be careful and intelligent supervision of the entire school by a dean or other executive officer who holds, and has sufficient authority to carry out, fair ideals as determined by the present day needs of graduate medical education.

4. *Curriculum and Grading of Instruction Offered.*—The graduate school should have its various courses of instruction so graded that the student, if he desires, can obtain progressive work in a continuous course of two or three years,[1] as may be necessary to prepare him satisfactorily for the practice of a chosen specialty. If it is found that at some previous time the student has satisfactorily completed certain portions of the work, he might be given advanced standing and thereby enabled to complete his preparation in a shorter time.

Where short courses are offered in any of the clinical specialties, these also should be *so graded that, in effect, they would be segments of and, in total, the time and educational equivalent of the longer courses.* These segments might be taken at different times, but would ultimately lead the student to the same objective. With the exception of the courses in general medicine, all short courses should fit in with a scheme, the ultimate aim of which would be a complete and satisfac-

1. The several fields of clinical specialization which are referred to are shown in the following list. The minimum years designated after each subject represent what were considered as essential to insure efficiency in the various specialties by the Committees on Graduate Medical Instruction in their reports which were presented at the Annual Conference on Medical Education, held in Chicago, March 7, 1921:

Field	Years Essential	Field	Years Essential
(a) Surgery, General	3	(g) Internal Medicine	3
(b) Surgery, Orthopedic	3	(h) Pediatrics	3
(c) Surgery, Genito-Urinary	3	(i) Neuropsychiatry	3
(d) Gynecol. and Obstet.	3	(j) Dermatology	2
(e) Ophthalmology	2	(k) Public Health and Hygiene	2
(f) Otolaryngology	2		

tory training in the specialty for which the graduate school provides instruction. Any institution offering work in any specialty, therefore, should provide (*a*) review courses in anatomy, pathology and the other basic preclinical sciences which apply to the respective specialties; (*b*) clinics in which students can have the opportunity personally to examine patients in hospital wards and outpatient departments and in which various therapeutic and operative procedures can be demonstrated; (*c*) courses of operative and laboratory technic; and (*d*)—to be assigned only when the student's previous training will warrant—assistantships in which, under the supervision of a physician who is recognized as an expert in the particular specialty, he can gradually assume responsibility in the diagnosis and therapeutic or operative treatment of the sick. Opportunity should be provided also for research work in the chosen specialty bearing on both the fundamental sciences and clinical fields. With courses so graded, no student should be admitted to any advanced short course unless, on careful investigation, he is found to possess the knowledge and skill, such as are obtainable in the other prerequisite courses.

5. *Teachers.*—The graduate medical school should be supplied with a corps of teachers well trained in and responsible for the work in all subjects in which opportunities for study are announced. This should include teachers for essential review or advanced work in the preclinical sciences, as well as those who have in charge work in clinical subjects. The teaching staff should be made up of graduates of or teachers in Class A medical colleges or other high grade educational institutions. The faculty should be organized under the various teaching departments in which work is offered, and a competent teacher should be at the head of each department.

6. *Laboratories.*—The school should possess well-equipped laboratories to provide proper review or advanced work in both laboratory and clinical subjects essential for the specialty or specialties in which opportunities are offered. There should also be an adequate supply of special apparatus, such as stereopticons, balopticons, photomicrographic outfits and roentgen-ray equipment.

7. *Library and Museum Facilities.*—All graduate work in medicine demands intensive reading in the field studied. Library facilities in most of the graduate schools are either totally lacking or wofully inadequate. In some instances, however, this lack is provided for by good medical libraries attached to other nearby institutions. The graduate school, therefore, should have a medical library which should include an ample supply of modern text and reference books, files of bound medical periodicals, and the essential indexes. It should also receive regularly thirty or more standard medical periodicals, the latest numbers of which should be on tables or in racks where they are easily accessible to the graduate students.

The school should be supplied with adequate museum facilities, including anatomic and pathologic specimens.

8. *Hospitals and Dispensaries.*—Graduate courses in clinical subjects cannot be presented profitably in lectures only. There are objections to allowing short term graduate medical students to assume responsibility for the diagnosis and treatment of patients; nevertheless, ample clinical material must be available for demonstrations for short course students and for the personal use of properly qualified students in the longer term. The graduate medical school, therefore, should have a teaching hospital with a daily average of 200 or more patients, and an outpatient clinic with an average of 100 or more patients each day; or, if teaching is limited to a single specialty, a hospital of not less than twenty-five patients daily, and an outpatient clinic of at least fifty patients daily. In brief, it should have sufficient clinical material to enable it to provide satisfactory clinical study in the specialty or specialties for which opportunities are offered. In connection with the courses for general practitioners, ample clinical material should be available so that the student may be given the opportunity personally to examine patients in hospital wards and in the outpatient department, and to make the essential laboratory examinations.

9. *Annual Announcements.*—The graduate school should publish annually announcements, bulletins or catalogues giving detailed information in regard to its teachers, laboratories, dispensaries and hospitals; outlines of the various opportunities for study offered in both fundamental and clinical branches; a complete list of the students enrolled during the last preceding year, showing their medical schools and years of graduation and the subjects for which they registered, and a list of those to whom advanced degrees or diploma-like certificates were granted.

10. *Advanced Degrees, Diplomas, Certificates.*—No advanced degree or diploma-like certificate should be granted to any one who is not known to be proficient in the specialty pursued; nor to any one, under any circumstances, who has not completed at least one academic year in full-time study of a single special subject in the institution granting the certificate; and unless scholarship records of the student show that, throughout the period, he has faithfully attended to his work, and unless reasonable tests show that he has diligently and satisfactorily completed the work for which he was registered.

Approved Graduate Medical Schools; Also Hospitals Providing Approved Residencies in Certain Specialties

ALBANY MEDICAL COLLEGE, Albany, N. Y.—Courses in Infectious Diseases and Public Health. Dr. Chas. C. Duryee, Director.

BARNES HOSPITAL, 600 S. Kingshighway, St. Louis.—Courses of instruction in the Dietetic and Insulin Treatment of Diabetes. Dr. L. D. Burlingham, Med. Supt.

BLOOMINGDALE HOSPITAL FOR MENTAL DISEASES, White Plains, New York.—Courses in Psychiatry. Dr. W. L. Russell, Med. Dir.

CHILDREN'S MEMORIAL HOSPITAL, 735 Fullerton Ave., Chicago.—Special Courses in Infant Feeding, Pediatrics and Otolaryngology. Dr. G. E. Baxter, Secretary.

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, New York.—Higher Degree and General Practice Courses. Special Summer Course in Public Health (U. S. P. H. S.). Dr. William Darrach, Dean.

CORNELL UNIVERSITY MEDICAL COLLEGE, New York.—Higher Degree and General Practice Courses. Dr. Walter L. Niles, Dean.

DETROIT COLLEGE OF MEDICINE AND SURGERY, Detroit, Mich.—Course in Public Health. Dr. I. Werness, Registrar.

HARVARD MEDICAL SCHOOL, Courses for Graduates, Boston.—Basic Review and General Practice Courses. Dr. Samuel R. Meaker, Dean.

HERMAN KNAPP MEMORIAL EYE HOSPITAL, School of Ophthalmology, 500 W. 57th St., New York City.—Courses in Diseases of the Eye. Dr. Gerald H. Grout, Secretary.

HOWARD UNIVERSITY SCHOOL OF PUBLIC HEALTH AND HYGIENE, Washington, D. C.—Dr. Algernon B. Jackson, Director.

JOHNS HOPKINS MEDICAL SCHOOL, Baltimore.—Special Residencies in the Johns Hopkins Hospital and General Practice Courses. Dr. Winford H. Smith, Director, Johns Hopkins Hospital.

MANHATTAN EYE, EAR AND THROAT HOSPITAL, School of Graduate Medical Instruction, 210 E. 64th St., New York City.—Special Internships in Eye and in Ear, Nose and Throat. Mr. Ruben O'Brien, Supt.

MASSACHUSETTS EYE AND EAR INFIRMARY, 243 Charles St., Cor. Fruit St., Boston.—Special Internships in Eye, and in Ear, Nose and Throat. Dr. Frederic A. Washburn, Director.

MONTEFIORE HOSPITAL, Gun Hill Road near Jerome Ave., New York City.—Special Residencies in Medicine, Neurology, Tuberculosis and Orthopedic Surgery. Dr. Ernst P. Boas, Med. Dir.

NEUROLOGICAL INSTITUTE, 149 E. 67th St., New York City.—Clinical Clerkships. Dr. E. G. Zabriskie, Secretary Medical Board.

NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL, Second Avenue and Twentieth St., New York City.—Special Internships and General Practice Courses. Dr. William D. Cutter, Dean.

NEW YORK SKIN AND CANCER HOSPITAL, 2nd Ave. and 19th St., New York City.—Courses for General Practitioners. Miss Sara Burns, R.N., Supt.

NEW YORK SOCIETY FOR THE RELIEF OF THE RUPTURED AND CRIPPLED, 321 East 42nd St., New York City.—Special Courses in Orthopedic Surgery. Dr. Joseph D. Flick, Supt.

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, Columbus.—Course in Public Health. Dr. E. R. Hayhurst, Head of Dept. of Public Health.

PENNSYLVANIA HOSPITAL, 4401 Market St., Philadelphia.—Courses in Neurology and Psychiatry. Dr. Earl D. Bond, Administrator.

PETER BENT BRIGHAM HOSPITAL, 721 Huntington Ave., Boston.—Special Courses in Medicine, Surgery, Pathology and Roentgenology. Dr. J. B. Howland, Supt.

PHYSIATRIC INSTITUTE, Morristown, New Jersey.—Diabetes and Other Metabolic Diseases. Dr. Frederick M. Allen, Director.

PROVIDENCE CITY HOSPITAL, Eaton St., Providence, Rhode Island.—Courses in Contagious Diseases. Dr. D. L. Richardson, Med. Supt.

STANFORD UNIVERSITY SCHOOL OF MEDICINE, San Francisco.—Summer Courses for Graduates. Dr. William Ophuls, Dean.

STATE HOSPITAL FOR MENTAL DISEASES, Howard, Rhode Island.—Courses in Neurology. Dr. Arthur H. Harrington, Med. Supt.

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, Iowa City.—Summer Courses in Public Health (U. S. P. H. S.). Dr. Lee Wallace Dean, Dean.

ST. ELIZABETH'S HOSPITAL, Claremont and LeMoyne Sts., Chicago.—Summer Courses in Clinical Medicine. Sister M. Cordula, Supt.

TRUDEAU SCHOOL OF TUBERCULOSIS, Saranac Lake, New York.—Courses for General Practitioners. Dr. E. R. Baldwin, Director.

TULANE UNIVERSITY GRADUATE SCHOOL OF MEDICINE (New Orleans Polyclinic), New Orleans.—Higher Degree and General Practice Courses. Dr. Charles Chassaignac, Dean.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, New York City.—Special Courses in Surgery. Dr. John Wyckoff, Secretary.

UNIVERSITY OF CALIFORNIA GRADUATE DIVISION, Berkeley-San Francisco. —Higher Degree and Public Health Courses (U. S. P. H. S.). Dr. Charles B. Lipman, Dean.
UNIVERSITY OF CHICAGO, RUSH MEDICAL COLLEGE, Wood and Harrison Sts., Chicago.—Special and Higher Degree Courses and Residencies.
UNIVERSITY OF COLORADO SCHOOL OF MEDICINE, Denver.—Course in Ophthalmology. Dr. Chas. N. Meader, Dean.
UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, Chicago. — Higher Degree Courses. Dr. Albert C. Eycleshymer, Dean.
UNIVERSITY OF MICHIGAN MEDICAL SCHOOL, Ann Arbor. — Summer Courses in Public Health (U. S. P. H. S.). Dr. Hugh Cabot, Dean.
UNIVERSITY OF MINNESOTA GRADUATE SCHOOL OF MEDICINE, Minneapolis-Rochester.—Higher Degree Fellowships and General Practice Courses. Dr. Guy Stanton Ford, Dean.
UNIVERSITY OF PENNSYLVANIA GRADUATE SCHOOL OF MEDICINE, Philadelphia.—Higher Degree and General Practice Courses. Dr. George H. Meeker, Dean.
UNIVERSITY OF WISCONSIN MEDICAL SCHOOL, Madison. — Course in Public Health. Miss G. K. McRae, Secretary.
WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, St. Louis.—Courses in Otolaryngology, Pediatrics, Infant Feeding, Obstetrics and Diseases of the Heart. Dr. William M. Marriott, Dean.
YALE UNIVERSITY SCHOOL OF MEDICINE, New Haven, Conn.—Course in Public Health. Write to Prof. I. V. Hinoch.
Bordeaux.—UNIVERSITY OF BORDEAUX, France.—Special Courses Otorhino Laryngological Surgery, Bronchoscopy, Plastic, Mastoid and Neck Surgery. For information apply to Dr. Leon Felderman, 4428 York Rd., Philadelphia, Pa.
London.—HOSPITAL FOR SICK CHILDREN, Great Ormond St., London, W. C. 1.—Special Graduate Course in Pediatrics. Address, Oswald L. Addison, Dean, Medical School.
London.—NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen Square, Bloomsbury, W. C. 1.—Special Courses and Lectures on the Nervous System. Dr. J. G. Greenfield, Dean, Medical School.
London.—UNIVERSITY OF LONDON, University Extension Dept., London, England.—Course of Lectures on Medical Hydrology. Dr. Halburt J. Waring, Dean.

GRADUATE COURSES IN MEDICAL SUBJECTS AND RESIDENCIES IN SPECIALTIES

WHERE THESE COURSES MAY BE OBTAINED

ANATOMY
Cornell University Medical College.
Harvard Medical School.
University of California Graduate Division, Berkeley (for advanced students).
University of Illinois College of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

ANESTHESIA
Harvard Medical School.
New York Post-Graduate Medical School.
University and Bellevue Hospital Medical College.
University of Pennsylvania Graduate School of Medicine.

BACTERIOLOGY
Cornell University Medical College.
Harvard Medical School.
New York Post-Graduate Medical School.
University of California Graduate Division.
University of Illinois College of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

BIOCHEMISTRY
Cornell University Medical College.
Harvard Medical School.
New York Post-Graduate Medical School.
University of California Graduate Division, Berkeley.
University of Illinois College of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

BRONCHOSCOPY
University of Pennsylvania Graduate School of Medicine.

CARDIOVASCULAR DISEASES
Harvard Medical School.
University of Pennsylvania Graduate School of Medicine.
Washington University School of Medicine.

CONTAGIOUS DISEASES
Providence City Hospital, Rhode Island (Residencies).

DENTAL, SURGERY
Mayo Foundation, Rochester, Minn. (Fellowships).

DERMATOLOGY
Cornell University Medical College.
Harvard Medical School.
Johns Hopkins Hospital (Residencies).
New York Post-Graduate Medical School.
New York Skin and Cancer Hospital.
Stanford University School of Medicine.
University of Minnesota Graduate School of Medicine (Fellowships).
University of Pennsylvania Graduate School of Medicine.

DIABETES
Harvard Medical School.
Physiatric Institute, Morristown, N. J.
University of Pennsylvania Graduate School of Medicine.

ELECTRO-THERAPEUTICS
Harvard Medical School.
University of Pennsylvania Graduate School of Medicine.

GASTRO-ENTEROLOGY
Columbia University College of Physicians and Surgeons.
Harvard Medical School.
University of Pennsylvania Graduate School of Medicine.

GENITO-URINARY
Harvard Medical School.

GYNECOLOGY
Harvard Medical School.
Johns Hopkins Hospital (Residencies).
New York Post-Graduate Medical School.
Stanford University School of Medicine.
University of California Graduate Division (Residencies).
University of Minnesota Graduate School of Medicine (Fellowships).
University of Pennsylvania Graduate School of Medicine.

IMMUNOLOGY
Harvard Medical School.
University of Pennsylvania Graduate School of Medicine.

INFANT FEEDING
Children's Memorial Hospital, Chicago.
University of Pennsylvania Graduate School of Medicine.
Washington University School of Medicine.

INSULIN TREATMENT
Barnes Hospital, St. Louis.
Columbia University College of Physicians and Surgeons.
Physiatric Institute, Morristown, N. J.

INTUBATION
University of Pennsylvania Graduate School of Medicine.

LARYNGOLOGY AND RHINOLOGY
Cornell University Medical College.
Manhattan Eye, Ear and Throat Hospital.
Massachusetts Eye and Ear Infirmary (Residencies).
New York Post-Graduate Medical School.
Stanford University School of Medicine.
Tulane University Graduate School of Medicine.
University of Bordeaux, France.
University of Chicago, Rush Medical College.
University of Minnesota Graduate School of Medicine (Fellowships).
Washington University School of Medicine.

MEDICAL HYDROLOGY
University of London, England.

MEDICINE
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Johns Hopkins Hospital (Residencies).
New York Post-Graduate Medical School.
Peter Bent Brigham Hospital, Boston (Residencies).
St. Elizabeth's Hospital, Chicago (Clinical Medicine).
University of California Graduate Division, Berkeley (Residencies).
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

METABOLIC DISEASES
Harvard Medical School.
Physiatric Institute, Morristown, N. J.
Stanford University School of Medicine.
University of Minnesota Graduate School of Medicine.

NEPHRITIS
Harvard Medical School.
Physiatric Institute, Morristown, N. J.

NEUROLOGY AND PSYCHIATRY
Bloomingdale Hospital for Mental Diseases, White Plains, N. Y.
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Harvard Medical School.
Johns Hopkins Hospital (Residencies).
Montefiore Hospital, New York City (Residencies).
National Hospital for the Paralysed and Epileptic, W. C. 1., London
Neurological Institute, New York City.
New York Post-Graduate Medical School.
Pennsylvania Hospital, Philadelphia (Residencies).
Stanford University School of Medicine.
State Hospital for Mental Diseases, Howard, R. I.
University of Minnesota Graduate School of Medicine (Fellowships).
University of Pennsylvania Graduate School of Medicine.

OBSTETRICS
Harvard Medical School.
Johns Hopkins Hospital (Residencies).
University of California Graduate Division (Residencies).
University of Minnesota Graduate School of Medicine.
Stanford University School of Medicine.
University of Pennsylvania Graduate School of Medicine.
Washington University School of Medicine.

OPHTHALMOLOGY AND OTOLOGY
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Harvard Medical School.
Herman Knapp Memorial Eye Hospital.
Johns Hopkins Hospital, Baltimore, Md.
Manhattan Eye, Ear and Throat Hospital.
Massachusetts Eye and Ear Infirmary (Residencies).
New York Post-Graduate Medical School.
Stanford University School of Medicine.
Tulane University Graduate School of Medicine.
University of Colorado School of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.
Washington University School of Medicine.

ORTHOPEDIC, SURGERY
Harvard Medical School.
New York Post-Graduate Medical School.
New York Society for the Relief of the Ruptured and Crippled, New York City (Residencies).
Stanford University School of Medicine.
University of Minnesota Graduate School of Medicine (Fellowships).
University of Pennsylvania Graduate School of Medicine.

OTOLARYNGOLOGY
Columbia University College of Physicians and Surgeons.
Harvard Medical School.
Johns Hopkins Hospital, Baltimore (Residencies).
New York Post-Graduate Medical School.
University of Chicago, Rush Medical College.
University of Bordeaux, France.
University of Minnesota Graduate School of Medicine (Fellowships).
University of Pennsylvania Graduate School of Medicine.
Washington University School of Medicine.

PARASITOLOGY AND TROPICAL MEDICINE
University of Pennsylvania Graduate School of Medicine.

PATHOLOGY
Cornell University Medical College.
Harvard Medical School.
Johns Hopkins Hospital, Baltimore.
New York Post-Graduate Medical School.
Peter Bent Brigham Hospital, Boston.
Stanford University School of Medicine.

University of California Graduate Division, Berkeley (for advanced students).
University of Illinois College of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

PEDIATRICS
Children's Memorial Hospital, Chicago.
Columbia University College of Physicians and Surgeons.
Harvard Medical School.
Hospital for Sick Children, London, England.
Johns Hopkins Hospital, Baltimore (Residencies).
New York Post-Graduate Medical School.
Stanford University School of Medicine.
University of California Graduate Division (Residencies).
University of Minnesota Graduate School of Medicine (Fellowships).
University of Pennsylvania Graduate School of Medicine.
Washington University School of Medicine.

PHARMACOLOGY
Cornell University Medical College.
Harvard Medical School.
Stanford University School of Medicine.
University of Illinois College of Medicine.
University of Pennsylvania Graduate School of Medicine.

PHYSIOLOGY
Cornell University Medical College.
Harvard Medical School.
University of California Graduate Division.
University of Pennsylvania Graduate School of Medicine.

PHYSIOTHERAPY
Harvard Medical School.
Stanford University School of Medicine.

PREVENTIVE MEDICINE (See Public Health)
Harvard Medical School.

PROCTOLOGY
Harvard Medical School.

PUBLIC HEALTH, HYGIENE AND PREVENTIVE MEDICINE
Albany Medical College.
Columbia University College of Physicians and Surgeons.
Detroit College of Medicine and Surgery.
Harvard Medical School.
Howard University School of Public Health and Hygiene, Washington, D. C.
Johns Hopkins Medical School, Baltimore.
Ohio State University College of Medicine.
State University of Iowa College of Medicine.
University of California Graduate Division.
University of Michigan Medical School.
University of Pennsylvania Graduate School of Medicine.
University of Wisconsin Medical School, Madison.
Yale University School of Medicine, New Haven.

RADIOLOGY
New York Skin and Cancer Hospital
Stanford University School of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

RESEARCH MEDICINE
University of California Graduate Division (for advanced students).

ROENTGENOLOGY
Harvard Medical School.
Johns Hopkins Hospital, Baltimore.
New York Post-Graduate Medical School.
New York Skin and Cancer Hospital.
Peter Bent Brigham Hospital, Boston.
University of Minnesota Medical School (Fellowship).

SURGERY (Surgical Anatomy, Surgical Diagnosis, Operative Surgery)
Columbia University College of Physicians and Surgeons.
Cornell University Medical College.
Harvard Medical School.
Johns Hopkins Hospital (Residencies).
New York Post-Graduate Medical School.
Peter Bent Brigham Hospital, Boston (Residencies).
Stanford University School of Medicine.
University and Bellevue Hospital Medical College.
University of California Graduate Division (Residencies).
University of Minnesota Graduate Medical School (Fellowships).
University of Pennsylvania Graduate School of Medicine.

SURGERY (Traumatic and Emergency)
New York Post-Graduate Medical School.

SYPHILOLOGY
Harvard Medical School.
New York Skin and Cancer Hospital.
Stanford University School of Medicine.
University of Pennsylvania Graduate School of Medicine.

TUBERCULOSIS
The Trudeau School of Tuberculosis, Saranac Lake, N. Y.
University of California Graduate Division (Residencies).
University of Pennsylvania Graduate School of Medicine.

UROLOGY
Johns Hopkins Hospital (Residencies).
New York Post-Graduate Medical School.
Stanford University School of Medicine.
University of Minnesota Graduate School of Medicine.
University of Pennsylvania Graduate School of Medicine.

Future Additions to List

This report does not rule out any graduate medical school. Other institutions which are offering higher degree opportunities in medical subjects, other hospitals with special residencies, and other graduate medical schools will be added to the list on application and after, on investigation, their educational standards and provisions for postgraduate education are found to comply with the principles governing graduate medical education.

DESCRIPTION OF MEDICAL COLLEGES

Below are given brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine, several of which do not grant degrees. The name, address, year of organization, history and date when first class graduated are given in each instance. Unless otherwise stated, a class graduated each subsequent year. Where official reports have been received from the college, information regarding faculty, entrance requirements, length of term, fees, students (excluding specials and postgraduates), graduates, name of dean and next session is given without discrimination. In a few instances in which such reports were not received, the information published is from other reliable sources. Figures for graduates include all who graduated since July 1, 1923. Extract of rules and the membership of the Association of American Medical Colleges are shown following the list of colleges. Figures showing population of cities and states are taken from the United States Census Bureau's report for 1920. Statements have been added showing the preliminary requirements held by state licensing boards where those requirements include one or two years of college work. Eleven states, Alaska (Ter.), Delaware, Illinois, Iowa, Michigan, New Jersey, North Dakota, Pennsylvania, Rhode Island, South Dakota and Washington, require also a year's hospital internship as an essential qualification for a license.

ALABAMA

Alabama, population 2,348,174, has one medical college, the School of Medicine of the University of Alabama, located in Tuscaloosa, a city with a population of 11,996.

In order to secure licenses to practice medicine in Alabama, students must complete two years of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language, prior to entering on the study of medicine.

Tuscaloosa

UNIVERSITY OF ALABAMA SCHOOL OF MEDICINE, University Campus, Tuscaloosa.—Organized in 1859 at Mobile as the Medical College of Alabama. Classes graduated in 1861 and subsequent years excepting 1862 to 1868, inclusive. Reorganized in 1897 as the medical department of the University of Alabama. Present title assumed in 1907 when all property was transferred to the University of Alabama. In 1920, clinical teaching was suspended and the medical school was removed to the university campus at Tuscaloosa. The faculty includes 7 professors and 6 instructors, assistants, etc., a total of 13. The course of study covers two years of thirty-six weeks each. The tuition fee each year is $260. The Dean is Dr. Clyde Brooks. Total registration for 1923-1924 was 70. The fifty-ninth session begins Sept. 10, 1924, and ends May 26, 1925.

ARKANSAS

Arkansas, population 1,752,204, has one medical college, the Medical Department of the University of Arkansas, located in Little Rock, a city of 65,142.

To secure licenses to practice medicine in Arkansas, students must complete two years of collegiate work, including college courses in physics, chemistry, biology and a modern language, before beginning the study of medicine.

Little Rock

UNIVERSITY OF ARKANSAS MEDICAL DEPARTMENT, Markham and Center Streets.—Organized in 1879 as the Medical Department of Arkansas Industrial University. It assumed the present title in 1899. In 1911 the College of Physicians and Surgeons united with it and the new school was made an integral part of the University of Arkansas. The first class was graduated in 1880. Clinical teaching was suspended in 1918 but resumed in 1923. The faculty consists of 20 professors and 22 lecturers and assistants, total 42. The curriculum embraces four years of thirty-four weeks each. Entrance requirements are two years of collegiate work in addition to a four-year high school course. The fees are $55 each year for resident, and $105 for nonresident students. The Acting Dean is Dr. Arthur R. Stover. The total registration for 1923-1924 was 114; graduates 10. The forty-sixth session begins Sept. 17, 1924, and ends June 4, 1925.

CALIFORNIA

California, population 3,426,861, has three medical colleges. Two are located in San Francisco, a city of 506,676 inhabitants. They are Stanford University School of Medicine and the College of Medicine of the University of California. The College of Medical Evangelists is located at Loma Linda and Los Angeles, the latter city having a population of 576,673.

To secure a license to practice medicine in California under the "physician's and surgeon's" certificate, students must complete at least a year of work of college grade including courses in physics, chemistry and biology before beginning the second half of the second year in the study of medicine.

Berkeley-San Francisco

UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL, University Campus, Berkeley; Second and Parnassus Avenues, San Francisco.—Organized in 1863 as the Toland Medical College. The first class graduated in 1864. In 1872 it became the Medical Department of the University of California. In 1909 the College of Medicine of the University of Southern California, at Los Angeles, by legislative enactment, became a clinical department. This Los Angeles portion was changed to a graduate school in 1914. In 1915 the Hahnemann Medical College of the Pacific was merged, and elective chairs in homeopathic materia medica and therapeutics were provided. Three years of collegiate work are required for admission. The work of the first year and a half is given at Berkeley and the work of the last two and a half years at San Francisco. The faculty is composed of 68 professors and 155 associates and assistants, a total of 223. The course covers four years of eight months each, and an additional fifth year consisting of an internship in a hospital or of special work in a department of the medical school. Fees for the four years, respectively, for residents of California are $290, $248, $235 and $225; nonresidents are charged $300 additional each year. The Acting Dean is Dr. L. S. Schmitt. Total registration for 1923-1924 was 211, graduates 43. The fifty-second session begins Aug. 15, 1924, and ends May 13, 1925.

Loma Linda-Los Angeles

COLLEGE OF MEDICAL EVANGELISTS.—Organized in 1909. The first class graduated in 1914. The laboratory departments are at Loma Linda; the clinical departments at Los Angeles on property bounded by Boyle, Michigan, Bailey and New Jersey streets. The faculty is composed of 48 professors and 98 associates, assistants and instructors, a total of 146. The course extends over five years of nine months each —the fifth year consisting of an internship in a hospital, or of special work in a department of the Medical School. The work of the first two years is given at Loma Linda and of the third and fourth years at Los Angeles. Two years of college work are required for admission. The total fees for the four years, respectively, are $221, $263, $258 and $255. The President is Dr. Newton Evans, Loma Linda, Calif., and the Dean of the Clinical Division is Dr. P. T. Magan, Los Angeles. The total registration for 1923-1924 was 223; graduates 58. The sixteenth session begins Sept. 3, 1924, and ends May 31, 1925.

San Francisco-Stanford University

STANFORD UNIVERSITY SCHOOL OF MEDICINE, Campus, Sacramento and Webster Streets, San Francisco.—Organized in 1908 when, by an agreement, the interests of Cooper Medical College were taken over. The first class was graduated in 1913. The faculty consists of 70 professors and 88 lecturers, assistants, etc., a total of 158. Three years of collegiate work are required for admission. The school has the quarter system and the completion of any three quarters constitutes a college year. The course covers four years of nine months each, plus a fifth year of practical or intern work. The total fees for each of the first four years are $261. The Dean is Dr. W. Ophüls, San Francisco. The total registration for 1923-1924 was 149; graduates 25. The fifteenth session begins Oct. 2, 1924, and ends June 17, 1925.

COLORADO

Colorado, with a population of 939,629, has one medical college, the University of Colorado School of Medicine. It is located in Denver, which has a population of 256,491.

The Colorado State Board of Medical Examiners will register without further examination graduates of medical colleges in good standing who present licenses issued after examination by any other licensing board. The law permits any one, graduate or nongraduate, to try the board's written examination.

Boulder-Denver

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE.—Organized in 1883. Classes were graduated in 1885 and in all subsequent years except 1898 and 1899. Denver and Gross College of Medicine were merged Jan. 1, 1911. The faculty embraces 33 professors and 28 lecturers, instructors and assistants, a total of 61. The work embraces a graded course of four years of nine months each and a year's internship in a hospital. The entrance requirements are two years of college work counting toward a degree in arts in an accredited college or university. The fees for residents of Colorado, for each of the four years are, respectively, $211, $211, $176 and $181. Nonresidents pay $105 more each year. The Dean is Dr. Charles N. Meader. The total registration for 1923-1924 was 123; graduates 18. The forty-third session begins Sept. 29, 1924, and ends June 15, 1925.

CONNECTICUT

Connecticut, with a population of 1,380,631, has one medical college, Yale University School of Medicine, located in New Haven, population 162,537.

Students who desire to practice medicine in Connecticut will not be eligible unless, prior to entering the study of medicine, they complete, in addition to an accredited four-year high school education, at least nine months of collegiate work including college courses in physics, chemistry and general biology.

New Haven

YALE UNIVERSITY SCHOOL OF MEDICINE, 150 York Street and at corner Congress Avenue and Cedar Street.—Chartered in 1810 as the Medical Institution of Yale College. Organized in 1812; instruction began in 1813; first class graduated in 1814. A new charter in 1879 changed the name to the Medical Department of Yale College. In 1884, the Connecticut Medical Society surrendered such authority as had been granted by the first charter. In 1887, Yale College became Yale University. The faculty consists of 30 professors and 106 lecturers and assistants, a total of 136. The requirements for admission are three years of collegiate work plus evidence of satisfactory completion of courses in general physics, general inorganic chemistry, qualitative analysis, general biology, organic chemistry and physical chemistry or laboratory physics, all reasonably equivalent to the courses in these subjects in Yale University. The student also must have two years of French or German. The course covers four years of nine months each. The fees for the four years, respectively, are $305, $300, $300 and $320. The Dean is Dr. Milton C. Winternitz. The total registration for 1923-1924 was 196; graduates, 44. The one hundred and twelfth session begins Sept. 25, 1924, and ends June 10, 1925.

DISTRICT OF COLUMBIA

The District of Columbia, population 437,571, has three medical colleges: George Washington University Medical School, Georgetown University School of Medicine and Howard University School of Medicine.

Washington

GEORGE WASHINGTON UNIVERSITY MEDICAL SCHOOL, 1335 H Street, N.-W.—Organized in 1825 as the Medical Department of Columbian College. Also authorized to use the name National Medical College. Classes were graduated in 1826 and in all subsequent years, except 1834 to 1838, and 1861 to 1863, inclusive. The original title was changed to Medical Department of Columbian University in 1873. In 1903 it absorbed the National University Medical Department. In 1904, by an act of Congress, the title of George Washington University was granted to the institution. The faculty is composed of 47 professors and 85 instructors, demonstrators and assistants, a total of 132. Two years of collegiate work are required for admission. The course covers four years of thirty-two weeks each. The fees for the four years, respectively, are $281, $278, $278 and $268. The Dean is Dr. William C. Borden. The total registration for 1923-1924 was 238; graduates, 29. The one hundred and first session begins Sept. 24, 1924, and ends June 3, 1925.

GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE, 920 H Street, N.-W.—Organized in 1851. The first class graduated in 1852. The faculty contains 63 professors, 38 instructors and assistants; total, 101. Two years of collegiate work are required for entrance. The course of study covers four terms of eight and one half months each. The fees for each of the four sessions, respectively, are $215, $200, $200 and $210. The Dean is Dr. George M. Kober. The registration for 1923-1924 was 197; graduates, 34. The seventy-fourth session begins Sept. 26, 1924, and ends June 9, 1925.

HOWARD UNIVERSITY SCHOOL OF MEDICINE, Fifth and W Streets, N.-W.—Chartered in 1867. Organized in 1869. The first class graduated in 1871. Colored students compose a majority of those in attendance. The faculty comprises 28 professors and 24 lecturers and assistants, 52 in all. The admission requirements are two years of collegiate work, including physics, chemistry, botany and zoology, English and two years of French or German. The course covers four years of thirty-three weeks each. The fees of each of the four sessions, respectively, are $168, $158, $158 and $165. The Dean is Dr. Edward A. Balloch. Registration for 1923-1924 was 236; graduates, 27. The fifty-seventh session begins Oct. 1, 1924, and ends June 5, 1925.

GEORGIA

Georgia, population 2,895,832, has two medical colleges, University of Georgia Medical Department, located in Augusta, population 52,548, and the Emory University School of Medicine in Atlanta, a city of 200,616.

In order to secure a license to practice medicine in Georgia, students must complete two years of work in an approved college of liberal arts and sciences, including courses in physics, chemistry and biology, prior to entering on the study of medicine.

Atlanta

EMORY UNIVERSITY SCHOOL OF MEDICINE, 98 N. Butler Street.—Organized in 1854. Classes graduated 1855 to 1861, when it suspended. Reorganized in 1865. A class graduated in 1865 and each subsequent year except 1874. In 1898 it merged with the Southern Medical College (organized in 1878), taking the name of Atlanta College of Physicians and Surgeons. In 1913 it merged with the Atlanta School of Medicine (organized in 1905), reassuming the name of Atlanta Medical College. Became the Medical Department of Emory University in 1915; assumed present title in 1917. Two years of collegiate work are required for admission. The faculty has 17 professors and 98 associates and assistants, a total of 115. The course of study is four years of thirty-four

weeks each. The fees for each of the four years, respectively, are $253, $233, $228 and $253. The Dean is Dr. W. S. Elkin. Total registration for 1923-1924 was 222; graduates, 57. The next session begins Sept. 24, 1924, and ends June 9, 1925.

Augusta

UNIVERSITY OF GEORGIA MEDICAL DEPARTMENT, University Place.—Organized in 1828 as the Medical Academy of Georgia, the name being changed to the Medical College of Georgia in 1829. Since 1873 it has been known as the Medical Department of the University of Georgia. Entire property transferred to the university in 1911. Classes were graduated in 1833 and in all subsequent years except 1862 and 1863. The faculty includes 14 professors and 38 assistants, 52 in all. Two years of collegiate work are required for entrance. The course is four years of thirty-four weeks each. Fees are $5 for matriculation and $100 each year for residents of Georgia and $300 each year for nonresidents. The Dean is Dr. Harry Goodrich. The total registration for 1923-1924 was 125; graduates, 31. The ninety-third session begins Sept. 15, 1924, and ends June 1, 1925.

ILLINOIS

Illinois, population 6,485,280, has five medical colleges, one of which gives instruction at night, all located in Chicago, a city of 2,701,705 inhabitants. They are as follows: Rush Medical College, Northwestern University Medical School, University of Illinois College of Medicine, Loyola University School of Medicine and the Chicago Medical School. The General Medical College was suspended June 30, 1924.

To be eligible for license to practice medicine in Illinois, students must complete two years of collegiate work including courses in physics, chemistry, biology and a modern language before entering on the study of medicine. In addition to their four year course in medicine they must complete also a year's internship in a hospital.

Chicago

RUSH MEDICAL COLLEGE.—Founded in 1837; organized in 1843; was the medical department of Lake Forest University from 1887 until 1898, when it became affiliated with the University of Chicago. The first class graduated in 1844. The faculty is composed of 117 professors, 177 associates, instructors, etc., a total of 294. The requirements for admission are three years of college work, including courses in college chemistry, physics and biology, and a reading knowledge of German or French. Classes are limited to 100 students in each of the freshman and sophomore classes, and to 130 students in each of the clinical years. No application for admission is accepted after September 1. The school operates under the "quarter system" in which the year is divided into four quarters of twelve weeks each; the completion of the work of three of these quarters gives credit for a college year. The course covers four years of eight and a half months each, and a fifth year, consisting of a hospital internship or of a fellowship in one of the departments. All freshman and sophomore studies are given at the University of Chicago. The clinical years are given in the building at the corner of Wood and Harrison Streets. The tuition fees for each of the four years, respectively, are $250, $240, $240 and $260. The Acting Dean is Dr. Ernest E. Irons. Total registration for 1923-1924 was 533, graduates, 129. The eightieth session begins Oct. 1, 1924, and ends June 14, 1925.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, 2421 South Dearborn Street.—Organized in 1859 as the Medical Department of Lind University. First class graduated in 1860. In 1864 it became independent as the Chicago Medical College. It united with Northwestern University in 1869, but retained the name of Chicago Medical College until 1891, when the present name was taken. Became an integral part of Northwestern University in 1905. The faculty comprises 72 professors and 111 lecturers and assistants, a total of 183. The requirements for admission are such as will admit to the College of Liberal Arts of Northwestern University, plus two years of college work, including courses in physics, chemistry, biology and a modern language. The course covers four years of eight months each. The fees for the four years, respectively, are $220, $220, $216 and $210. The Acting Dean is Dr. James Persons Simonds. The total registration for 1923-1924 was 423; graduates, 93. The sixty-fifth session begins Sept. 30, 1924, and ends June 13, 1925.

UNIVERSITY OF ILLINOIS COLLEGE OF MEDICINE, 508 S. Honore Street.—Organized in 1882 as the College of Physicians and Surgeons. The first class graduated in 1883. It became the Medical Department of the University of Illinois by affiliation in 1897 and an integral part in 1910. The relationship with the university was canceled in June, 1912, but restored in March, 1913, when the present title was assumed. Two years of collegiate work are required for admission. The curriculum covers four years of thirty-three weeks each, and a year's internship in an approved hospital. The faculty is composed of 69 professors, 134 assistants and instructors, a total of 203. The tuition fees are $165 each year for resident students and $35 extra for nonresidents. The Dean is Dr. Albert C. Eycleshymer. The total registration for 1923-1924 was 428; graduates, 71. The forty-third session begins Oct. 6, 1924, and ends June 12, 1925.

LOYOLA UNIVERSITY SCHOOL OF MEDICINE, 706 S. Lincoln St., Chicago.—Organized in 1868 as the Bennett College of Eclectic Medicine and Surgery. Eclecticism dropped and title of Bennett Medical College assumed in 1909. First class graduated in 1870, and a class graduated each subsequent year. Absorbed the Illinois Medical College in 1910 and the Reliance Medical College in 1911. In 1910 it became by affiliation the School of Medicine of Loyola University; the university assumed full control in 1915. Took over by purchase the Chicago College of Medicine and Surgery in 1917. Two years of college work are required for admission. The faculty is composed of 64 professors, 50 assistants and instructors, a total of 114. The total fees are $300 each year. The Dean is Dr. Louis D. Moorhead. The total enrolment for 1923-1924 was 289; graduates, 23. The next session begins Oct. 1, 1924, and ends June 13, 1925.

CHICAGO MEDICAL SCHOOL, an afternoon and night school, located at 3832 Rhodes Avenue.—Organized in 1911 as the Chicago Hospital College of Medicine; chartered in 1912. In December, 1917, the classes of the Jenner Medical College were transferred to it. Total registration for 1923-1924 was 136; graduates, 22. *Official reports state that the diplomas from this college are not recognized by the licensing boards of Illinois and of forty-five other states.*

INDIANA

Indiana, population 2,930,390, has one medical college, the Indiana University School of Medicine, located at Indianapolis, a city of 314,194 people, except that the work of the first year is offered also at Bloomington, the seat of the University.

Students who intend to practice medicine in Indiana must complete two years of collegiate work, in addition to an accredited four-year high school course, prior to beginning the study of medicine.

Bloomington and Indianapolis

INDIANA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1903, but did not give all of the work of the first two years of the medical course until 1905. In 1907, by union with the State College of Physicians and Surgeons, the complete course in medicine was offered. In 1908 the Indiana Medical College, which was formed in 1905 by the merger of the Medical College of Indiana (organized in 1878), the Central College of Physicians and Surgeons (organized in 1879), and the Fort Wayne College of Medicine (organized in 1879), merged into it. The first class was graduated in 1908. The faculty consists of 65 professors and 100 lecturers, associates and assistants, a total of 165. Two years of collegiate work are required for admission. The work of the first year is emphasized only at Bloomington. The work of the other three years is all at Indianapolis. The fees each year are $175 for residents of Indiana and $250 for nonresidents. Matriculation fee, $5; microscope fee, $5 to $7.50 per semester. A fifth optional intern year leading to the "M.D. cum laude" has been added. The Assistant Dean at Bloomington is Dr. B. D. Myers; the Dean is Dr. Charles P. Emerson, Indianapolis. The total registration for 1923-1924 was 346; graduates, 70. The next session begins Sept. 15, 1924, and ends June 10, 1925.

IOWA

Iowa, population 2,404,021, has one medical college, the College of Medicine of the State University of Iowa, located in Iowa City, population 11,267.

Students who desire to practice medicine in Iowa must complete two years of work in an approved college of liberal arts prior to beginning the study of medicine, this preliminary college work to have included courses in physics, chemistry, biology and a foreign language. Hereafter, also, they must have completed a year's internship in an approved hospital.

Iowa City

STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE, University Campus.—Organized in 1869. First session began in 1870. First class graduated in 1871. Absorbed Drake University College of Medicine in 1913. The faculty is made up of 34 professors, 46 lecturers, demonstrators and assistants, a total of 80. Two years of college work, including courses in physics, chemistry, biology, French or German and English, are required for admission. The course of study covers four years of thirty-four weeks each. The tuition fee is $175 each year for residents of Iowa and $350 for nonresidents, plus a matriculation fee of $10 and a graduation fee of $10. The Dean is Dr. Lee Wallace Dean, Iowa City. Total registration for 1923-1924 was 365; graduates, 49. The fifty-fifth session begins Sept. 22, 1924, and ends June 6, 1925.

KANSAS

Kansas, population 1,769,257, has one medical college. The School of Medicine of the University of Kansas gives its first two years in Lawrence, population 12,456, and the last two years in Rosedale, a suburb of Kansas City, which with Kansas City, Mo., have a combined population of 433,261.

Students who desire to practice medicine in Kansas must complete at least two years of collegiate work including college courses in physics, chemistry and biology in addition to an accredited four-year high school course.

Lawrence and Rosedale

UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.—Organized in 1880. It offered only the first two years of the medical course until in 1905, when it merged with the Kansas City (Mo.) Medical College, founded in 1869, the College of Physicians and Surgeons, founded in 1894, and

the Medico-Chirurgical College, founded in 1897. First class graduated in 1906. The clinical courses are given at Rosedale. Absorbed Kansas Medical College in 1913. The faculty, including lecturers and clinical assistants, numbers 65. The requirements for admission are two years of collegiate work. The course covers four years of nine months each. The total fees for residents of the state for each of the four years are, respectively, $125, $125, $145 and $145. For nonresidents the fees are $10 additional each year. The Associate Dean is Dr. M. T. Sudler. The total registration for 1923-1924 was 137; graduates, 23. The forty-fifth session begins Sept. 10, 1924, and ends June 9, 1925.

KENTUCKY

Kentucky, population 2,416,630, has one medical college, the University of Louisville Medical Department, situated in Louisville, a city of 234,891 inhabitants.

To be eligible for license to practice medicine in Kentucky, students must complete two years of college work, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine.

Louisville

UNIVERSITY OF LOUISVILLE SCHOOL OF MEDICINE, First and Chestnut Streets.—Organized in 1837 as Louisville Medical Institute. The first class graduated in 1838, and a class graduated in each subsequent year except in 1863. In 1846 name changed to University of Louisville Medical Department. In 1907 it absorbed the Kentucky University Medical Department; in 1908 the Louisville Medical College, the Hospital College of Medicine and the Kentucky School of Medicine. In the fall of 1922 it became more closely correlated in the University of Louisville and changed its name to the University of Louisville School of Medicine. About the same time it assumed complete control of the professional side of the Louisville City Hospital on a twelve months' basis, under an agreement with the City Administration, the Dean becoming Chairman of the Hospital Staff Executive Committee and the Professor of Medicine the Hospital Staff Executive, with the Hospital Superintendent as business manager and secretary. Two years of college work required for admission. It has a faculty of 26 professors, 18 associate and assistant professors, 3 lecturers, 42 instructors and 23 assistants, a total of 112. Students limited to 75 Freshmen, 65 Sophomores, 60 Juniors and 60 Seniors. Course covers four years of thirty-two weeks each exclusive of vacations and examinations. Fees for four years are, respectively, $260, $260, $270 ad $290. The Dean is Dr. Stuart Graves. Total registration for 1923-1924 was 250; graduates, 48. Next session begins Sept. 8, 1924, and ends June 4, 1925.

LOUISIANA

Louisiana, having a population of 1,798,509, contains one medical college, the School of Medicine of the Tulane University of Louisiana, situated in New Orleans, a city of 387,219.

Students who desire to practice medicine in Louisiana must complete, at an approved college or university, two years of college work, including biology, physics, chemistry and a modern language, before entering on the study of medicine.

New Orleans

TULANE UNIVERSITY OF LOUISIANA SCHOOL OF MEDICINE, University Campus and 1551 Canal Street.—Organized in 1834 as the Medical College of Louisiana. Classes were graduated in 1835 and in all subsequent years except 1863-1865, inclusive. It was transferred to the Medical Department of the University of Louisiana in 1847 and became the Medical Department of the Tulane University of Louisiana in 1884. Present name in 1913, when it became the School of Medicine of the College of Medicine of the Tulane University of Louisiana. The faculty has 35 professors and 108 assistant professors, instructors and assistants, a total of 143. The course covers four years of thirty-two weeks each. Two years of collegiate work are required for admission. Total fees for each of the four years, respectively, are $235, $235, $225 and $255. The Dean is Dr. Charles C. Bass. The total registration for 1923-1924 was 362; graduates, 84. The ninetieth session begins Sept. 25, 1924, and ends June 10, 1925.

MARYLAND

Maryland, with a population of 1,449,661, contains two medical colleges, located in Baltimore, a city with 733,826 inhabitants. They are as follows: Johns Hopkins University Medical Department, and the University of Maryland School of Medicine and College of Physicians and Surgeons.

To be eligible to practice medicine in Maryland, students, in addition to a four-year high school education, must complete at least two years of college work including courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine.

Baltimore

JOHNS HOPKINS UNIVERSITY MEDICAL DEPARTMENT, Washington and Monument Streets.—Organized in 1893. The first class graduated in 1897. The faculty consists of 61 professors and 175 clinical professors, etc., a total of 236. The requirements for admission demand that the applicant either has (*a*) completed the chemical-biologic course which leads to the A.B. degree in the university, or (*b*) graduated at an approved college or scientific school and has a knowledge of French and German (two years each of college instruction), physics and biology, such as may be obtained from a year's course, and a three years' course in chemistry. The course extends over four years of eight and one-half months each. The total fees for each of the four years are, respectively, $311, $317, $317 and $317. The Dean is Dr. Lewis H. Weed. Total registration for 1923-1924 was 307; graduates, 80. The thirty-second session begins Sept. 29, 1924, and ends June 9, 1925.

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND THE COLLEGE OF PHYSICIANS AND SURGEONS, Lombard and Greene Streets.—Organized in 1807 as the College of Medicine of Maryland. The first class graduated in 1810. In 1812 it became the University of Maryland School of Medicine. Baltimore Medical College was merged into it in 1913. In 1915 the College of Physicians and Surgeons was merged and the present name assumed. The faculty consists of 90 professors and 130 instructors and assistants, a total of 220. Two years of college work are required for admission. The course covers four years of eight months each. The total fees are $270 each year for residents of the state; $320 each year for nonresidents. The Dean is Dr. J. M. H. Rowland. Total registration for 1923-1924 was 340; graduates, 78. The one hundred and eighteenth session begins Sept. 29, 1924, and ends June 6, 1925.

MASSACHUSETTS

Massachusetts, population 3,852,356, has five medical colleges: Medical School of Harvard University, Boston University School of Medicine, Tufts College Medical School, College of Physicians and Surgeons and the Middlesex College of Medicine and Surgery. They are all situated in Boston, a city of 748,060, except the last named, which is in Cambridge, a city of 109,694.

Boston

MEDICAL SCHOOL OF HARVARD UNIVERSITY, 240 Longwood Avenue.—Organized in 1782. The first class graduated in 1788. It has a faculty of 87 professors and 218 instructors and assistants, a total of 305. Candidates for admission must present a college degree or two years of work leading to such a degree with standing in the upper third of the class. The college work must include a year of physics, biology, general chemistry, a half year of organic chemistry, and a reading knowledge of French or German. The total fee for each of the four years is $300 plus $5 the first year for matriculation. The Dean is Dr. David L. Edsall. The total registration for 1923-1924 was 494; graduates, 122. The one hundred and forty-second session begins Sept. 22, 1924, and ends June 18, 1925.

BOSTON UNIVERSITY SCHOOL OF MEDICINE, 80 East Concord Street.—Organized in 1873. In 1874 the New England Female Medical College, founded in 1848, was merged into it. The first class graduated in 1874. Became nonsectarian in 1918. Two years of collegiate work are required for admission. The faculty includes 22 professors, 77 associates, etc., making a total of 99. The course covers four years of thirty-six weeks each. Total fees for each of the four years, respectively, are $281, $281, $256 and $266. The Dean is Dr. Alexander S. Begg. Total registration for 1923-1924 was 208; graduates 46. The fifty-second session begins Sept. 22, 1924, and ends June 15, 1925.

TUFTS COLLEGE MEDICAL SCHOOL, 416 Huntington Avenue.—Organized in 1893 as the Medical Department of Tufts College. The first class graduated in 1894. It has a faculty of 49 professors and 107 assistants, lecturers, etc., a total of 156. Two years of collegiate work are required for admission. The course covers four years of eight months each. The total fees for each of the four years are $260, $245, $235 and $240. The Dean is Dr. Stephen Rushmore. Total registration for 1923-1924 was 507; graduates, 136. The twenty-ninth session begins Sept. 23, 1924, and ends May 29, 1925.

COLLEGE OF PHYSICIANS AND SURGEONS, 517 Shawmut Avenue.—Organized in 1880. The first class graduated in 1882. Total attendance of medical students, 1923-1924 was about 26. There were about 7 graduates. *This college has been reported not recognized by the Massachusetts Medical Society and by the licensing boards of forty-five states.*

Cambridge

MIDDLESEX COLLEGE OF MEDICINE AND SURGERY, Cambridge.—Organized in 1914 under the charter of the Worcester Medical College, which became extinct in 1859. A class was graduated in 1915 and each subsequent year. Was closely related in its interests with an osteopathic college and granted a liberal advanced standing for work done in osteopathic colleges. During 1923-1924 the total enrolment was 117; graduates, 28. *This college has been reported as not recognized by licensing boards of forty-six states.* In connection with the recent medical licensure investigation in Connecticut a drastic report in regard to this college was issued by the Special Grand Jury.

MICHIGAN

Michigan, population 3,668,412, has two medical colleges; the University of Michigan Medical School, located at Ann Arbor, a city of 19,516 people, and the Detroit College of Medicine and Surgery, located at Detroit, a city of 993,678 inhabitants.

Students who desire to practice medicine in Michigan, in addition to an accredited four-year high school education, must complete two years of work in an approved college of

liberal arts, including college courses in physics, chemistry, biology and French or German, prior to beginning the study of medicine. Candidates must also have completed an internship in a hospital.

Ann Arbor

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL.—Organized in 1850 as the University of Michigan Department of Medicine and Surgery. The first class graduated in 1851. Present title assumed in 1915. It has a faculty composed of 23 professors, 17 assistant and associate professors and 100 associates, instructors, etc., a total of 140. The entrance requirements are two years of college work, including courses in chemistry, physics and biology, with laboratory work, and a reading knowledge of one modern language. The curriculum embraces four years of nine months each. The total fees for Michigan students are for men, $220 per year, and for women $215 per year, plus a matriculation fee of $17.50; for nonresidents, $80 per year additional. The matriculation fee for nonresidents is $25. The Dean is Dr. Hugh Cabot. The total registration for 1923-1924 was 597; graduates, 138. The seventy-fifth session begins Sept. 23, 1924, and ends June 15, 1925.

Detroit

DETROIT COLLEGE OF MEDICINE AND SURGERY, 1516 St. Antoine St.—Organized as the Detroit College of Medicine in 1885 by consolidation of Detroit Medical College, organized in 1868, and the Michigan College of Medicine, organized in 1880. Reorganized with present title in 1913. The first class graduated in 1886. In 1918 it became a municipal institution under the control of the Detroit Board of Education. Entrance requirements are two years of college work. The faculty embraces 21 professors, 95 lecturers, etc., a total of 116. The course covers four years of nine months each and a fifth hospital intern year. The total fees each year for residents of Detroit are $145; for nonresidents, $200. The Dean is Dr. W. H. MacCraken. The total registration for 1923-1924 was 191; graduates, 25. The fortieth session begins Sept. 29, 1924, and ends June 20, 1925.

MINNESOTA

Minnesota, population 2,387,125, contains one medical school, the University of Minnesota Medical School, situated in Minneapolis, a city of 380,582 inhabitants.

Students intending to practice medicine in Minnesota, in addition to an accredited four-year high school education, must complete two years of college work the equivalent of that done in the liberal arts department of the University of Minnesota, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Minneapolis

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL.—Organized in 1883 as the University of Minnesota College of Medicine and Surgery, reorganized in 1888 by absorption of St. Paul Medical College and Minnesota Hospital College. The first class graduated in 1889. In 1908 the Minneapolis College of Physicians and Surgeons, organized in 1883, was merged. In 1909 the Homeopathic College of Medicine and Surgery was merged. Present title in 1913. The faculty includes 128 professors and 152 instructors and assistants, a total of 280. The curriculum covers four years of nine months each, and a year's internship in an approved hospital. The school is operated on the four-quarter plan. The entrance requirements are two years of university work, which must include six semester credits of rhetoric, eight semester credits of physics; thirteen credits of general chemistry, qualitative and quantitative analysis and organic chemistry; eight credits of zoology, and a reading and qualitative knowledge of French or German. Students are required to secure a degree of B.S. or A.B. before receiving the degree of Bachelor of Medicine (M.B.) which is granted at the end of the four-year course. The M.D. is conferred after a year of intern work or of advanced laboratory work has been completed. Classes are graduated twice a year, in June and in December. Total fees are $202 for residents and $232 for nonresidents, each year of three quarters. The Dean is Dr. E. P. Lyon. The total registration for 1923-1924 was 411; graduates, 58. The thirty-sixth session begins Sept. 29, 1924, and ends June 15, 1925. The summer quarter began June 24.

MISSISSIPPI

Mississippi, population 1,790,618, has one medical college, the Department of Medicine of the University of Mississippi, which is located at Oxford, a city of 2,150 inhabitants.

Students desiring to practice medicine in Mississippi, in addition to a standard four-year high school education, must complete two years of work in an approved college or university, including courses in physics, chemistry, biology and a modern language, before entering on the study of medicine.

Oxford

UNIVERSITY OF MISSISSIPPI SCHOOL OF MEDICINE.—Organized in 1903. Gives only the first two years of the medical course. In 1908 a clinical department was established at Vicksburg, but was discontinued in 1910 after graduating one class. The session extends over eight and a half months. Entrance requirements are two years of collegiate work. The total fees each year are $168. The faculty numbers 18. The Dean is Dr. J. O. Crider. The total registration for 1923-1924 was 68. The twenty-second session begins Sept. 17, 1924, and ends June 2, 1925.

MISSOURI

Missouri, population 3,404,055, has six medical colleges. The School of Medicine of the University of Missouri is at Columbia, a town of 10,392 people. St. Louis, population 772,897, contains three medical schools, viz., the School of Medicine of St. Louis University, Washington University Medical School, and the St. Louis College of Physicians and Surgeons. Kansas City, which, with Kansas City, Kansas, has a population of 433,261, has two colleges, the Kansas City College of Medicine and Surgery and the Kansas City University of Physicians and Surgeons. The last three are reported as not approved or reputable by the Misouri State Board of Health.

Columbia

UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE.—Organized at St. Louis in 1845; was discontinued in 1855, but was reorganized at Columbia in 1872. Teaching of the clinical years was suspended in 1909. The faculty includes 11 professors and 15 assistant professors, lecturers, etc., a total of 26. The course covers two years of thirty-six weeks each. The entrance requirements are two years of college work including French or German, 8 hours; general zoology, 8 hours; physics, 8 hours; inorganic chemistry, 8 hours; organic chemistry, 5 hours, and general bacteriology, 3 hours. Total fees are $106 for each year. Nonresidents of the state pay $10 per term extra. The Dean is Dr. Guy L. Noyes. Total registration for 1923-1924 was 77. The next session begins Sept. 10, 1924, and ends June 3, 1925.

Kansas City

KANSAS CITY COLLEGE OF MEDICINE AND SURGERY, Twenty-Third and Holmes Streets.—Organized in 1915 as an offshoot of the Eclectic Medical University, a Class C medical school, now extinct. It claims to be an eclectic college, but is reported not recognized as such by the National Eclectic Medical Association. For 1923-1924 only 17 students were reported, these having been listed as graduates. Since this school is an offshoot of a Class C medical college and is *reported not recognized by the Missouri State Board of Health and by the licensing boards of forty-two other states*, no higher rating can be granted to it, pending an inspection, which it has refused. Was closely involved in the Missouri diploma mill scandal as shown by the drastic report regarding it issued by the Connecticut Special Grand Jury, March 14, 1924.

KANSAS CITY UNIVERSITY OF PHYSICIANS AND SURGEONS, 729 Troost Street.—Originally chartered in 1903 as the Central College of Osteopathy; charter amended in 1917, by which it obtained the right to grant degrees in medicine, and the name was changed to the Central College Medical Department. Present title in 1918. Very liberal advanced standing allowed for work done in osteopathic colleges; reported as still having osteopathic classes. Total enrolment in 1923-1924 was 54; graduates, 21. The Dean is Dr. A. M. Wilson. The next session begins Sept. 9, 1924, and ends May 28, 1925. Rated in Class C by the Council on Medical Education and Hospitals. *Reported not recognized by the licensing boards of Missouri and of forty-seven other states.*

St. Louis

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, Kingshighway and Euclid Avenue.—Organized in 1842 as the Medical Department of St. Louis University. In 1835 it was chartered as an independent institution under the name of St. Louis Medical College. The first class graduated in 1843. In 1891 it became the Medical Department of Washington University. In 1899 it absorbed the Missouri Medical College. The faculty comprises 40 professors and 125 lecturers, instructors, etc., a total of 165. Two years of college work are required for admission, including courses in English, physics, chemistry and biology, and a reading knowledge of German or French. The course is four years of eight months each. The total fees for the four years are, respectively, $315, $310, $310 and $315. The Dean is Dr. McKim Marriott. The total registration for 1923-1924 was 291; graduates, 77. The next session begins Sept. 25, 1924, and ends June 11, 1925.

ST. LOUIS UNIVERSITY SCHOOL OF MEDICINE, 1402 South Grand Avenue.—Organized in 1901 as the Marion-Sims-Beaumont Medical College by union of Marion-Sims Medical College, organized in 1890, and Beaumont Hospital Medical College, organized in 1886. First class graduated in 1902. It became the Medical Department of St. Louis University in 1903. The faculty is composed of 76 professors and 127 lecturers and assistants, a total of 203. Two years of collegiate work are required for admission. The curriculum covers four years of thirty-two weeks each. The summer season is optional. The total fees are $300 each year. The Dean is Dr. Hanau W. Loeb. The total registration for 1923-1924 was 432; graduates, 94. The next session begins Oct. 1, 1924, and ends May 31, 1925.

ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS, Jefferson and Gamble Streets.—Organized in 1869. Classes graduated in 1870 and each subsequent year until 1873, when it suspended. Reorganized in 1879. Classes graduated in 1880 and subsequent years until 1915, when it merged with the Medical Department of the National University of Arts and Sciences. Reestablished in 1916. Registration during 1923-1924 was approximately 19; graduates, about 8. *This college is reported as not recognized by the licensing boards of Missouri and forty-six other states.* This school was closely involved in the Missouri diploma mill scandal as shown by the drastic report regarding it issued by the Connecticut Special Grand Jury, March 14, 1924.

NEBRASKA

Nebraska, population 1,296,372, has two medical colleges, the University of Nebraska College of Medicine and the Creighton University College of Medicine, both in Omaha, population 191,601.

Omaha

CREIGHTON UNIVERSITY COLLEGE OF MEDICINE, Fourteenth and Davenport Streets.—Organized in 1892 as the John A. Creighton Medical College. Present title in 1921. The first class graduated in 1893. It has a faculty of 35 professors and 38 instructors, lecturers and assistants, a total of 73. Two years of collegiate work are required for admission. The course of study embraces four years of eight months each. The total fees each year for the four years are, respectively, $195, $190, $190 and $200. The Dean is Dr. Hermann von W. Schulte. Total registration for 1923-1924 was 164; graduates, 38. The forty-third session begins Sept. 24, 1924, and ends June 6, 1925.

UNIVERSITY OF NEBRASKA COLLEGE OF MEDICINE, Forty-Second Street and Dewey Avenue.—Organized in 1881 as the Omaha Medical College. The first class graduated in 1882. It became the Medical Department of Omaha University in 1891. In 1902 it affiliated with the University of Nebraska, with the present title. The first two years were given at Lincoln and the last two in Omaha until 1913, when all four years were transferred to Omaha. The faculty is composed of 45 professors and 53 lecturers and instructors, total 98. Two years of collegiate work are required for admission, including courses in physics, chemistry and zoology. The fees for each of the four years, respectively, are $180, $170, $160 and $160. The Dean is Dr. Irving S. Cutter. Total registration for 1923-1924, was 321; graduates, 52. The next session begins Sept. 15, 1924, and ends June 6, 1925.

NEW HAMPSHIRE

New Hampshire, population 443,083, has one medical college, located at Hanover, population 1,551.

Students desiring to practice medicine in New Hampshire, in addition to a four-year high school education, must complete at least two years of work in an approved college of liberal arts, prior to beginning the study of medicine.

DARTMOUTH MEDICAL SCHOOL.—Organized as New Hampshire Medical Institute in 1797. The first class graduated in 1798. It is under the control of the trustees of Dartmouth College. Clinical teaching was discontinued in 1914. The faculty is made up of 11 professors and 2 instructors, a total of 13. Three years of collegiate work are required for admission. The course covers nine calendar months in each year, or eight months of actual teaching. Candidates for the A.B. or B.S. degree in Dartmouth College may substitute the work of the first year in medicine for that of the senior year in the academic department. The fees for each year are $300. Dean, Dr. John M. Gile. The total registration for 1923-1924 was 44. The next session opens Sept. 17, 1924, and ends June 23, 1925.

NEW YORK

New York State, population 10,384,829, has eight medical colleges. Five of these, College of Physicians and Surgeons (Columbia University), Cornell University Medical College, the University and Bellevue Hospital Medical College, Long Island College Hospital and the New York Homeopathic Medical College and Flower Hospital, are located in New York City, population 5,620,048. Albany Medical College is located in Albany, a city of 113,344 people. The University of Buffalo Medical Department is situated in Buffalo, population 506,775. The College of Medicine, Syracuse University, is in Syracuse, a city of 171,717 inhabitants. The new medical school of the University of Rochester will be open for medical students in the Fall of 1925.

Students who desire to practice in New York must complete two years of college work before entering on the study of medicine.

Albany

ALBANY MEDICAL COLLEGE, 58-64 Eagle Street.—Organized in 1838. The first class graduated in 1839. It became the Medical Department of Union University in 1873. In 1915 Union University assumed educational control. The faculty is composed of 25 professors and 77 instructors, assistants, etc., a total of 102. Two years of collegiate work, including college courses in physics, chemistry (including organic and analytics), biology, English, and a modern foreign language, are required for admission. The curriculum covers four years of eight months each. The total fees for the four years, respectively, are $320, $305, $305 and $305. The Dean is Dr. Thomas Ordway. The total registration for 1923-1924 was 89; graduates, 18. The ninety-fourth session begins Sept. 22, 1924, and ends June 8, 1925.

Buffalo

UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT, High Street, near Main.—Organized in 1846. The first class graduated in 1847. It absorbed the Medical Department of Niagara University in 1898. The faculty is composed of 54 professors and 91 lecturers, assistants, etc., a total of 145. Two years of collegiate work, including college courses in physics, chemistry, biology, English and French or German are required for admission. The course covers four years of eight months each. The total fees for each of the four years are $322, $317, $317 and $327. The Dean is Dr. C. Sumner Jones. Total registration for 1923-1924 was 244; graduates, 61. The seventy-ninth session begins Sept. 22, 1924, and ends June 10, 1925.

New York

COLUMBIA UNIVERSITY COLLEGE OF PHYSICIANS AND SURGEONS, 437 West Fifty-Ninth Street.—Organized in 1807 by the regents of the University of the State of New York as their medical department. The first class graduated in 1811. In 1860 it became, by affiliation, the Medical Department of Columbia College. It was made a permanent part of Columbia College by legislative enactment in 1891. That institution became Columbia University in 1896. The faculty is composed of 105 professors and 211 instructors, demonstrators, etc., a total of 316. Two years of collegiate work of 72 points, including courses in physics, chemistry, biology, English and either French or German, are required for admission. The work covers four years of eight months each. The Dean is Dr. William Darrach. The total fees for the four years, respectively, are $332, $332, $332 and $352. Total registration for 1923-1924 was 377; graduates, 88. The one hundred and seventeenth session begins Sept. 24, 1924, and ends June 3, 1925.

CORNELL UNIVERSITY MEDICAL COLLEGE, First Avenue and Twenty-Eighth Street, New York City, and Ithaca.—Organized in 1898. The first class was graduated in 1899. The work of the first year may be taken either in Ithaca or in New York. The faculty is composed of 73 professors and 110 assistants, lecturers, instructors, etc., a total of 183. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also have a knowledge of physics, chemistry, biology, English and a modern language. The fees for each of the four years are, respectively, $345, $335, $335 and $350. The Dean is Dr. Walter L. Niles. Total registration for 1923-1924 was 230; graduates, 58. The twenty-seventh session begins Sept. 24, 1924, and ends June 11, 1925.

LONG ISLAND COLLEGE HOSPITAL, 350 Henry Street, Brooklyn.—Organized in 1858. The first class graduated in 1860. It has a faculty of 71 professors and 88 assistants, instructors, etc., a total of 159. Two years of collegiate work, including college courses in physics, chemistry and biology, are required for admission. The course covers four years of eight months each. The fees for the four years, respectively, are $366, $356, $381 and $386. The Dean is Prof. Adam M. Miller. Total registration for 1923-1924 was 357; graduates, 48. The sixty-seventh session begins Sept. 22, 1924, and ends May 28, 1925.

NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL, Eastern Boulevard, between Sixty-Third and Sixty-Fourth Streets.—Organized in 1858. Incorporated in 1860 as the Homeopathic Medical College of the State of New York. The title New York Homeopathic Medical College was assumed in 1869. Present title assumed in 1908. The first class graduated in 1861. The course covers four years of eight months each. It has a faculty of 29 professors and 57 lecturers and assistants, a total of 86. The total fees for the four years are, respectively, $360, $350, $350 and $380. The Dean is Israel S. Kleiner, Ph.D. Total registration for 1923-1924 was 169; graduates, 29. The sixty-fifth session begins Sept. 19, 1924, and ends June 2, 1925.

UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE, 338 East Twenty-Sixth Street.—Organized in 1898 by the union of the New York University Medical College, organized in 1841, and the Bellevue Hospital Medical College, organized in 1861. It is the Medical Department of New York University. First class graduated in 1899. The faculty is composed of 84 professors, associate professors and assistant professors, and 135 lecturers, instructors, etc., in all, 219. The course covers four years of eight months each. Entrance requirements are 72 semester hours of collegiate work in a registered college leading to a bachelor's degree, including courses in physics, chemistry and biology. The fees for each of the four years, respectively, are $372, $374, $329 and $347. The Dean is Dr. Samuel A. Brown. Total registration for 1923-1924 was 428; graduates, 101. The next session begins Sept. 17, 1924, and ends June 10, 1925.

Syracuse

SYRACUSE UNIVERSITY COLLEGE OF MEDICINE, 307-311 Orange Street.—Organized in 1872, when the Geneva Medical College, chartered in 1834, was removed to Syracuse, under the title "The College of Physicians and Surgeons of Syracuse University." Present title assumed in 1875, when a compulsory three-year graded course was established. The first class graduated in 1873 and a class graduated each subsequent year. In 1889 the amalgamation with the university was made complete. Course extended to four years in 1896. The faculty is composed of 31 professors and 85 associate and assistant professors, lecturers and instructors, a total of 116. Two years of a recognized college course are required for admission. The course covers four years of thirty-four weeks each. The fees for each of the first three years are $340, for the fourth year $350. The Dean is Dr. Herman G. Weiskotten. The total enrolment for 1923-1924 was 181; graduates, 38. The fifty-fourth session begins Sept. 22, 1924, and ends June 15, 1925.

NORTH CAROLINA

North Carolina, population 2,559,123, has two medical schools, each of which gives only the first two years of the medical course. The School of Medicine of the University of North Carolina is located at Chapel Hill, population 1,483. Wake Forest College School of Medicine is at Wake Forest, population 1,425.

Students intending to practice medicine in North Carolina must complete two years of college work including courses in physics, chemistry and biology in addition to 14 units of high school work before beginning the study of medicine.

Chapel Hill

UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE.—Organized in 1890. Until 1902 this school gave only the work of the first two years, when the course was extended to four years by the establishment of a department at Raleigh. The first class graduated in 1903. A class was graduated each subsequent year, including 1910, when the clinical department at Raleigh was discontinued. Two years of collegiate work are required for admission. The faculty is composed of 9 professors and 4 lecturers, assistants, etc., a total of 13. The fees for each year are $195. The Dean is Dr. I. H. Manning. The total registration for 1923-1924, was 69. The thirty-ninth session begins Sept. 18, 1924, and ends June 5, 1925.

Wake Forest

WAKE FOREST COLLEGE SCHOOL OF MEDICINE.—This school was organized in 1902. The faculty, including the professors of chemistry, physics and biology, numbers 10 professors and 6 assistants. Only the first two years of the medical course are offered. After the completion of freshman and sophomore college work and two years of medicine, a certificate will be given. The B.S. degree in medicine will be given only after completion of three years of college work and two years of medicine. Each annual course extends over nine months. The fees for each year aggregate $200. The Dean is Dr. Thurman D. Kitchin. The total registration for 1923-1924 was 63. The twenty-third session begins Sept. 16, 1924, and ends June 5, 1925.

NORTH DAKOTA

North Dakota, population 645,680, has one medical college, the School of Medicine of the University of North Dakota, which is situated at University, a suburb of Grand Forks, a city of 14,010 people. It gives only the first two years of the medical course.

Students intending to practice medicine in North Dakota, in addition to a four-year high school education, must complete two years of work in an approved college of liberal arts including courses in Latin, physics, chemistry, botany and zoology, prior to beginning the study of medicine, and must show evidence of having spent at least one year as an intern in a hospital.

University

UNIVERSITY OF NORTH DAKOTA SCHOOL OF MEDICINE.—Organized in 1905. Offers only the first two years of the medical course. Two years' work in a college of liberal arts is required for admission. The fees are about $50 each year. The faculty consists of 7 professors and 8 instructors, a total of 15. The Dean is Dr. Harley E. French. The total registration for 1923-1924 was 36. The nineteenth session begins Sept. 20, 1924, and ends June 9, 1925.

OHIO

Ohio, population 5,759,394, has four medical colleges. Two of these, the Medical College of the University of Cincinnati and the Eclectic Medical College, are located in Cincinnati, a city of 401,247 inhabitants. Cleveland, population 796,841, contains one medical school, Western Reserve University School of Medicine. Columbus, population 237,031, contains the Ohio State University College of Medicine.

Cincinnati

UNIVERSITY OF CINCINNATI COLLEGE OF MEDICINE, Eden Avenue, Cincinnati General Hospital.—Organized in 1909 by the union of the Medical College of Ohio (founded in 1819) with the Miami Medical College (founded in 1852). The Medical College of Ohio became the Medical Department of the University of Cincinnati in 1896. Under a similar agreement, March 2, 1909, the Miami Medical College also merged into the University, when the title of Ohio-Miami Medical College of the University of Cincinnati was taken. Present title assumed in 1915. Two years of college work are required for admission. The faculty consists of 76 professors and 40 associates, assistants, etc., a total of 116. The course covers four years of eight months each. The fees for each of the four years, respectively, are $320, $320, $320 and $270. The Dean is Dr. Henry Page. The total registration for 1923-1924 was 237; graduates, 64. The next session begins Sept. 22, 1924, and ends June 12, 1925.

ECLECTIC MEDICAL COLLEGE, 630 West Sixth Street.—Organized in 1833 at Worthington as the Worthington Medical College. Removed to Cincinnati in 1843. In 1845 it was chartered as the Eclectic Medical Institute. In 1857 the American Medical College, organized in 1839, was merged into it, and in 1859 the Eclectic College of Medicine and Surgery, organized in 1856, was merged into it. In 1910 it assumed its present title. Classes were graduated in 1833 and in all subsequent years except 1839 to 1843, inclusive. It has a faculty of 29 professors and 23 lecturers and assistants, a total of 52. Two years of college work are required for admission. The course covers four years of eight months each. The total fees for the four years, respectively, are $170, $160, $160 and $160. The Dean is Dr. R. L. Thomas. Total registration for 1923-1924 was 127; graduates, 27. The next session begins Sept. 18, 1924, and ends May 18, 1925.

Cleveland

WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE, 2109-15 Adelbert Road.—Organized in 1843 as the Cleveland Medical College. The first class graduated in 1844. It assumed the present title in 1881. In 1910 the Cleveland College of Physicians and Surgeons was merged. The faculty includes 18 professors and 148 lecturers, assistants, etc., a total of 166. The curriculum embraces three years of eight and one-half months each and one year of eleven months. Three years of college work are required for admission. The total fees for each of the four years are, respectively, $275, $265, $250 and $260. The Dean is Dr. C. A. Hamann. The total registration for 1923-1924 was 191; graduates, 42. The eighty-second session begins Sept. 25, 1924, and ends June 18, 1925.

Columbus

OHIO STATE UNIVERSITY COLLEGE OF MEDICINE, 710 North Park Street.—Organized in 1907 as the Starling-Ohio Medical College by the union of Starling Medical College (organized 1847) with the Ohio Medical University (organized 1890). In 1914 it became an integral part of the Ohio State University with its present title. The faculty consists of 45 professors and 60 lecturers, demonstrators, etc., a total of 105. Two years of collegiate work are required for admission. The course covers four years of 34 weeks each. Tuition fees are $153 each year for residents of Ohio; for nonresidents, the fees are $258. The Dean is Dr. Eugene F. McCampbell. The total registration for 1923-1924 was 280; graduates, 46. The next session begins Sept. 30, 1924, and ends June 16, 1925.

OKLAHOMA

Oklahoma, population 2,028,283, has one medical college, the School of Medicine of the University of Oklahoma. The work of the first and second years is given on the academic campus at Norman, a city of about 5,004 inhabitants. The work of the third and fourth years is given in Oklahoma City, which has a population of 91,295 and which is eighteen miles north of Norman.

Students intending to practice medicine in Oklahoma, in addition to a four-year high school education, must complete two years of work in an approved college of liberal arts, including courses in physics, chemistry, biology and a modern language prior to beginning the study of medicine.

Norman and Oklahoma City

UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE.—Organized in 1900. Gave only the first two years of the medical course at Norman until 1910, when a clinical department was established at Oklahoma City. The first class graduated in 1911. It has a faculty of 6 professors and associate professors, 67 assistant professors and instructors, a total of 73. Two years of college work are required for admission. The course is four years of nine months each. An optional course of six years is offered for the degrees of B.S. and M.D. The total fees for the four years are, respectively, $100, $100, $21 and $21. The Dean is Dr. LeRoy Long, School of Medicine Building, Third and Stiles Street, Oklahoma City, Okla. The total registration for 1923-1924 was 148; graduates, 21. The twenty-fifth session begins Sept. 15, 1924, and ends June 9, 1925.

OREGON

Oregon, population 783,389, has one medical college, the University of Oregon Medical School, located in Portland, a city of 258,288 population.

Portland

UNIVERSITY OF OREGON MEDICAL SCHOOL, Marquam Hill.—Organized in 1887. The first class graduated in 1888, and a class graduated each subsequent year except 1898. The Williamette University Medical Department was merged in 1913. It has a faculty of 53 professors and 85 lecturers, assistants, etc., a total of 138. Entrance requirements are three years of college work or its equivalent. The course is four years of thirty-four weeks each. The total fees for the four years are, respectively, $185, $180, $180 and $180 for residents of Oregon and $60 per year additional for nonresidents. The Dean is Dr. Richard B. Dillehunt. The total registration for 1923-1924 was 193; graduates, 41. The thirty-eighth session begins Sept. 30, 1924, and ends June 15, 1925.

PENNSYLVANIA

Pennsylvania, population 8,720,017, has six medical colleges. Of these, Philadelphia, having a population of 1,823,779, contains five, as follows: University of Pennsylvania School of Medicine, Jefferson Medical College, Hahnemann Medical College and Hospital, Woman's Medical College of Pennsylvania and Temple University Department of Medicine. The other school, the School of Medicine of the University of Pittsburgh, is situated in Pittsburgh, a city of 588,343.

Students intending to practice medicine in Pennsylvania, in addition to a four-year high school education, must complete a year's work in an approved college of liberal arts, including

college courses in physics, chemistry and biology, before beginning the study of medicine. They must also have completed an internship of at least one year in an approved hospital.

Philadelphia

UNIVERSITY OF PENNSYLVANIA SCHOOL OF MEDICINE, Thirty-Sixth Street and Hamilton Walk.—Organized in 1765. Classes were graduated in 1768 and in all subsequent years except 1772-1779, inclusive. The original title was the Department of Medicine, College of Philadelphia. The present title, School of Medicine of the University of Pennsylvania, was adopted in 1909. It granted the first medical diploma issued in America. In 1916 it took over the Medico-Chirurgical College of Philadelphia to develop it as a graduate school. The faculty consists of 63 professors, associate and assistant professors, and 161 lecturers, associates, instructors, etc., a total of 224. All candidates for admission must be graduates of approved colleges or scientific schools or seniors of approved colleges which will permit them to substitute the first year of this medical school for the fourth year of their college course and will confer on them the Bachelor degree on the completion of the year's work. The candidate must also present evidence that a sufficient amount of work has been completed in physics, biology or zoology, chemistry, including general inorganic, organic and analytical, English and French or German. The first class is limited to 110 students; third and fourth to 135 each. The course embraces four years of study of thirty-three weeks each. The total fees for each of the four years are, respectively, $333, $325, $325 and $329 for men and $15 less per year for women students. The Dean is Dr. William Pepper. Total registration for 1923-1924 was 474; graduates, 132. The one hundred and fifty-ninth session begins Sept. 25, 1924, and ends June 17, 1925.

JEFFERSON MEDICAL COLLEGE, Tenth and Walnut Streets.—Organized in 1825 with its present title as the Medical Department of Jefferson College, Cannonsburg, Pa. Classes have been graduated annually since 1826. In 1838 a separate university charter was granted without change of title, since which time it has continued under the direction of its own board of trustees. It has a faculty of 45 professors, associate and assistant professors, and 130 associates, lecturers, demonstrators and instructors, a total of 175. Entrance requirements are a completed standard four-year high school or college preparatory course, or the equivalent, and in addition two years of work leading to a degree in an approved college of arts and science amounting to at least 60 semester hours, including specified courses in physics, general and organic chemistry and biology, with laboratory work in each subject. The course of study covers four years of eight and a half months each. The fees are about $325 each year, with a matriculation fee of $10 paid on admission. The Dean is Dr. Ross V. Patterson. The total registration for 1923-1924 was 593; graduates, 145. The one hundredth session begins Sept. 23, 1924, and ends June 5, 1925.

WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA, Twenty-First and N. College Avenue.—Organized in 1850. Classes were graduated in 1852 and in all subsequent years except 1862. It has a faculty of 17 professors and 50 assistants, lecturers, etc., in all, 67. Entrance requirements are a completed course in a standard secondary school, and in addition two years of collegiate work, including courses in physics, chemistry, biology and French or German. The curriculum covers four years of eight months each. Fees for each of the four years are, respectively, $275, $279, $277 and $269. The Dean is Dr. Martha Tracy. The total registration for 1923-1924 was 110; graduates, 32. The seventy-fifth session begins Sept. 24, 1924, and ends June 3, 1925.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF PHILADELPHIA, 220-24 North Broad Street.—Organized in 1848 as the Homeopathic Medical College of Pennsylvania. In 1869 it united with the Hahnemann Medical College of Philadelphia, taking the latter title. Assumed present title in 1885. The first class graduated in 1849. Entrance requirements are a completed course in a standard secondary school and in addition two years devoted to a college course, including English and either French, German or Spanish, physics, chemistry and biology. It has a faculty of 52 professors and 62 lecturers, instructors, etc., in all, 114. The work covers four years of eight and a half months each. Total fees are $260 each year. The Dean is Dr. William A. Pearson. The total registration for the college year 1923-1924 was 210; graduates, 45. The seventy-seventh session begins Sept. 30, 1924, and ends June 4, 1925.

THE TEMPLE UNIVERSITY SCHOOL OF MEDICINE, Eighteenth and Buttonwood Streets.—Organized in 1901. The first class graduated in 1904. The faculty numbers 20 professors and 115 associates, assistants, etc., a total of 135. Two years of college work are required for admission. The fees for each of the four years, respectively, are $230, $225, $215 and $215. The Dean is Dr. Frank C. Hammond. The total registration for 1923-1924 was 184; graduates, 15. The twenty-fourth session begins Sept. 22, 1924, and ends June 18, 1925.

Pittsburgh

UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE, Bigelow Boulevard.—Organized in 1886, as the Western Pennsylvania Medical College and in 1908 became an integral part of the University of Pittsburgh, removing to the university campus in 1910. The first class graduated in 1887. The faculty is composed of 17 professors and 133 associates, assistants, etc., 150 in all. Entrance requirements are two years of college work, including English, chemistry (inorganic and organic), physics, biology and a reading knowledge of French or German, Italian or Spanish. The course of study is four years of eight and a half months each. The total fees for the four years, respectively, are $327.50, $312.50, $312.50 and $322.50. The Dean is Dr. Raleigh R. Huggins. The total registration for 1923-1924 was 212; graduates, 36. The thirty-ninth session begins Sept. 29, 1924, and ends June 10, 1925.

SOUTH CAROLINA

South Carolina, population 1,683,724, has one medical college, situated in Charleston, a city of 67,957 people.

Students intending to practice medicine in South Carolina must complete, in addition to 14 units of high school work, two years in an approved college, including courses in English, physics, chemistry and biology.

Charleston

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA, 16 Lucas Street.—Organized in 1823 as the Medical College of South Carolina. The first class graduated in 1825. In 1832 a medical college bearing the present title was chartered and the two schools continued as separate institutions until they were merged in 1838. Classes were graduated in all years except 1862 to 1865, inclusive. In 1913, by legislative enactment, it became a state institution. It has a faculty of 35 professors and 33 lecturers, instructors, etc., a total of 68. The course covers four years of eight months each. Two years of collegiate work including courses in physics, chemistry, biology and a modern foreign language are required for admission, in addition to a standard high school preparation. The total fees are $165 annually. The Dean is Dr. Robert Wilson, Jr. Total enrolment for 1923-1924 was 147; graduates, 28. The ninety-sixth session begins Sept. 25, 1924, and ends June 4, 1925.

SOUTH DAKOTA

South Dakota, population 636,547, has one medical college, the University of South Dakota College of Medicine, located at Vermilion, a town of 2,590 people.

Students intending to practice medicine in South Dakota must show that they matriculated in and graduated from medical colleges which required at least two years of collegiate work for admission, including courses in physics, chemistry, biology and a modern language. Beginning in 1925, a year's internship in an approved hospital will also be required.

Vermilion

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE.—Organized in 1907. Offers only the first two years of the medical course. Two years' work in a college of liberal arts are required for admission. The fees are $60 each year. The faculty numbers 11. The Dean is Christian P. Lommen, B.S. The total registration for 1923-1924 was 36. The eighteenth session begins Sept. 18, 1924, and ends June 13, 1925.

TENNESSEE

Tennesse, population 2,337,885, has three medical colleges. Of these, Vanderbilt University School of Medicine and Meharry Medical College are situated in Nashville, a city with a population of 118,342. The College of Medicine of the University of Tennessee is located in Memphis, population 162,351.

Students intending to practice medicine in Tennessee must complete two years of collegiate work, including courses in physics, chemistry, biology and a modern language, in addition to a four-year high school course, before entering on the study of medicine.

Memphis

UNIVERSITY OF TENNESSEE COLLEGE OF MEDICINE, three buildings, 879 Madison Avenue.—Organized in 1876 at Nashville as Nashville Medical College. First class graduated 1877, and a class graduated each subsequent year. Became Medical Department of University of Tennessee in 1879. In 1909 it united with the Medical Department of the University of Nashville to form the joint Medical Department of the Universities of Nashville and Tennessee. This union was dissolved in 1911. The trustees of the University of Nashville by formal action of that board named the University of Tennessee College of Medicine as its legal successor. In 1911 it moved to Memphis, where it united with the College of Physicians and Surgeons. The Memphis Hospital Medical College was merged in 1913. Lincoln Memorial University Medical Department was merged in 1914. The faculty includes 53 professors and 85 assistants, instructors, etc., a total of 138. Entrance requirements are a high school education plus two years of collegiate work. Students taking the two-year premedical course in Knoxville may secure the B.S. and M.D. degrees. The total fees for the four years, respectively, are $107, $102, $102 and $127 for residents of the state, and $100 more each year for nonresidents. The Dean is Dr. James B. McElroy. Total registration for 1923-1924 was 209; graduates, 47. The next session begins Sept. 27, 1924, and ends June 8, 1925.

Nashville

VANDERBILT UNIVERSITY SCHOOL OF MEDICINE.—This school was founded in 1874. The first class graduated in 1875. The faculty consists of 23 professors and 86 lecturers, a total of 109. Two years of collegiate work is required for admission. The course covers four years of nearly nine months each. The total fees for the four years, respectively, are $200, $200, $200 and $225. The Acting Dean is Dr. Lucius E. Burch. The total registration for 1923-1924 was 192; graduates, 49. The fifty-first session begins Sept. 24, 1924, and ends June 10, 1925.

MEHARRY MEDICAL COLLEGE. Colored. 1118 First Avenue, South.—This school was organized in 1876 as the Medical Department of Central Tennessee College, which became Walden University in 1900. First class graduated in 1877. Obtained new charter independent of Walden University in 1916. The faculty is made up of 20 professors and 24 instructors, demonstrators, lecturers, etc., 44 in all. The work embraces four years of thirty-one weeks each. The total fees for the four years, respectively, are $162, $152, $155 and $175. The President is Dr. John J. Mullowney. Total registration for 1923-1924 was 172; graduates, 38. The forty-ninth session begins Oct. 1, 1924, and ends May 21, 1925.

TEXAS

Texas, population 4,663,228, has two medical colleges. The University of Texas School of Medicine is located at Galveston, a city of 44,255 inhabitants. The Baylor University College of Medicine is located in Dallas, population 158,976.

Students intending to practice medicine in Texas must complete at least a year of collegiate work, including courses in physics, chemistry, biology and modern language, in addition to a standard four-year high school course, before entering on the study of medicine. Beginning in 1926, two years of preliminary college work will be required.

Dallas

BAYLOR UNIVERSITY COLLEGE OF MEDICINE, 720 College Avenue.—Organized in 1900 as the University of Dallas Medical Department. In 1903 it took its present name and became the Medical Department of Baylor University. It acquired the charter of Dallas Medical College in 1904. The first class graduated in 1901. The faculty consists of 44 professors and 51 instructors and assistants, a total of 95. Entrance requirements are two years of college work in addition to a four-year high school education. The course is four years of eight months each. The fees for each of the four years, respectively, are $208, $198, $188 and $188. The Dean is Dr. Walter H. Moursund. Total registration for 1923-1924 was 201; graduates, 19. The twenty-fifth session begins Sept. 29, 1924, and ends June 1, 1925.

Galveston

UNIVERSITY OF TEXAS SCHOOL OF MEDICINE, Avenue B, between Ninth and Tenth Streets.—Organized in 1891. The first class graduated in 1892. It has a faculty of 12 professors and 38 lecturers and instructors, a total of 50. The curriculum embraces four years of eight months each. The entrance requirement is two years of collegiate work in addition to a four year high school education. The freshman class is limited to 60 students on a scholarship basis, Texans having preference. The total fees for the four years, respectively, are $108, $83, $45 and $43 for residents of the state, and $150 additional each year for nonresidents. The Acting Dean is Dr. W. Keiller. Total registration for 1923-1924 was 256; graduates, 70. The thirty-fourth sessions begins Oct. 1, 1924, and ends May 31, 1925.

UTAH

Utah, population 449,396, has one medical college, the School of Medicine of the University of Utah, situated at Salt Lake City, which has 118,110 people.

Students intending to practice medicine in Utah, in addition to a four-year high school education, must complete at least one year of collegiate work, including courses in physics, chemistry and biology, prior to beginning the study of medicine.

Salt Lake City

UNIVERSITY OF UTAH SCHOOL OF MEDICINE.—Organized in 1906. Gives only first two years of medical course. Each course covers thirty-six weeks. Three years of collegiate work are required for admission. The medical faculty consists of 11 professors and 15 lecturers and assistants, a total of 26. The fees are $150 each year. The Dean is Dr. Ralph O. Porter. Total registration for 1923-1924 was 46. The eighteenth session begins Sept. 25, 1924, and ends June 5, 1925.

VERMONT

Vermont, population 352,428, has one medical school, located at Burlington, a town of 22,779 people.

Students who desire to practice medicine in Vermont, in addition to a standard four-year high school education, must complete two years of collegiate work, including college courses in physics, chemistry and biology, before entering on the study of medicine.

Burlington

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE, Pearl Street, College Park.—Organized with complete course in 1822. Classes graduated in 1823 to 1836, inclusive, when the school was suspended. It was reorganized in 1853 and classes were graduated in 1854 and in all subsequent years. The faculty includes 19 professors, 5 associate and assistant professors and 19 instructors, assistants, etc., a total of 43. Two years of college work in addition to a four-year high school education are required for admission. The course of study covers four years of nine months each. For residents of Vermont the total fees for each of the first three years are $200 and $225 for the fourth year. Nonresidents are charged an additional $100 each year. The Dean is Dr. H. C. Tinkham. The total registration for 1923-1924 was 126; graduates, 33. The next session begins Sept. 18, 1924, and ends June 22, 1925.

VIRGINIA

Virginia, population 2,309,187, has two medical colleges, one, the Department of Medicine of the University of Virginia, situated in Charlottesville, population 10,688, and the Medical College of Virginia at Richmond, population 171,667.

Students desiring to practice in Virginia must be graduates of medical colleges which require that all students admitted shall have completed two years of collegiate work, including courses in physics, chemistry, biology and a modern language, preferably German, in addition to a four-year high school education.

Charlottesville

UNIVERSITY OF VIRGINIA DEPARTMENT OF MEDICINE.—Organized in 1827. Classes were graduated in 1828 and in all subsequent years except 1865. It has a faculty of 25 professors and 22 lecturers, instructors, assistants, etc., a total of 47. The requirements for admission are the completion of a four-year high school course, or its equivalent, and two years of college work devoted to English, mathematics, chemistry, physics and biology. Total fees for the four years, respectively, are $235, $235, $185 and $175. The Dean is Dr. Theodore Hough. The total registration for 1923-1924 was 193; graduates, 30. The ninety-sixth session begins Sept. 18, 1924, and ends June 16, 1925.

Richmond

MEDICAL COLLEGE OF VIRGINIA, Twelfth and Clay Streets.—Organized in 1838 as the Medical Department of Hampden Sydney College. Present title was taken in 1854. In 1913 the University College of Medicine was merged. In 1914 the North Carolina Medical College was merged. Classes were graduated in 1840 and in all subsequent years. It has a faculty of 45 professors and 80 lecturers, instructors, etc., a total of 125. The requirement for admission is a four-year high school education and in addition two years of collegiate work, including courses in physics, chemistry, biology and English. The course embraces four years of eight months each. Total fees for the four years, respectively, are $280, $280, $270 and $300. The Dean is Dr. Manfred Call. The total registration for 1923-1924 was 303; graduates, 74. The eighty-sixth session begins Sept. 17, 1924, and ends June 2, 1925.

WEST VIRGINIA

West Virginia, population 1,463,701, has one medical college, the School of Medicine of West Virginia University, which offers the first two years of the medical course. It is located at Morgantown, a city of 12,127 population.

Students who desire to practice medicine in West Virginia must complete, in addition to a high school education, two years of collegiate work, including courses in physics, chemistry and biology, before entering on the study of medicine.

Morgantown

WEST VIRGINIA UNIVERSITY SCHOOL OF MEDICINE.—Organized in 1902, and gives only the first two years of the medical course. Two years of college work are required for admission and the Bachelor's degree will be granted to those who finish the two years in medicine. Session extends through nine months. The faculty numbers 16. Fees: For residents of the state, $90 each year; for nonresidents, $240. Cadets pay laboratory fees only. The Dean is Dr. John N. Simpson. The total registration for 1923-1924 was 106. The next session begins Sept. 15, 1924, and ends June 11, 1925.

WISCONSIN

Wisconsin, population 2,632,067, has two medical colleges, the Medical School of the University of Wisconsin, which teaches the first two years of the medical course, and is located at Madison, a city of 38,378 people, and the Marquette University School of Medicine, located at Milwaukee, a city of 457,147 people.

Students intending to practice medicine in Wisconsin, prior to entering a medical school, must complete, besides a four-year high school course, two years of collegiate work, including courses in physics, chemistry, biology and a modern language.

Madison

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL.—Organized in 1907. For matriculation at least two years in a college of arts and science or an equivalent training are required, including two years of Latin, a reading knowledge of French or German, and at least a year's work in physics, chemistry and biology. It has a faculty of 23 professors and 47 lecturers, instructors, etc., a total of 70. Thus far the school has offered only the first two years of the medical course. In the fall of 1925 the work of the third year will be given, and in the fall of 1926 and thereafter the entire four-year course. Tuition fees: for residents of the state, $115 for first year and $95 for second year; for nonresidents, $210 for first year and $185 for second year. The Dean is Dr. Charles R. Bardeen. The registration for 1923-1924 was 157. The seventeenth session begins Sept. 24, 1924, and ends June 22, 1925.

Milwaukee

MARQUETTE UNIVERSITY SCHOOL OF MEDICINE, Fourth Street and Reservoir Avenue.—Organized in December, 1912, by the merger of the Milwaukee Medical College and the Wisconsin College of Physicians and Surgeons. It has a faculty of 121. The entrance requirements are two years of college work, including courses in physics, chemistry, biology and a modern language. The curriculum covers four years of eight and a half months each, plus an additional fifth year's internship in an approved hospital. The fees for the four years, respectively, are $313, $303, $303 and $283. The Dean is Dr. Louis F. Jermain; the Dean of students is Dr. Eben J. Carey. The registration for 1923-1924 was 225; graduates, 28. The thirteenth session begins Sept. 29, 1924, and ends June 10, 1925.

PHILIPPINE ISLANDS

The Philippine Archipelago, with a population of 10,607,872, has two medical colleges, the University of the Philippines College of Medicine and Surgery and the University of St. Thomas College of Medicine and Surgery. They are located in the city of Manila, which in 1914 had a population of 283,613.

Manila

UNIVERSITY OF THE PHILIPPINES COLLEGE OF MEDICINE, Manila.—Organized in 1907 as the Philippine Medical School, under the support of the government of the Philippine Islands. In 1910 the title was changed to University of the Philippines College of Medicine and Surgery. Present title in 1923. The faculty includes 35 professors and 42 lecturers, assistants, etc., a total of 77. A two-year collegiate course, including courses in English, physics, chemistry, biology and either French or German is required for admission. The course extends over five years. In the fifth year the students serve as interns in the Philippine General Hospital. The fees for the four years, respectively, are $81, $74, $59 and $56. The Dean is Dr. Fernando Calderon. The total registration for 1923-1924 was 142; graduates 11. The eighteen session began June 16, 1924, and ends March 17, 1925.

UNIVERSITY OF ST. THOMAS COLLEGE OF MEDICINE AND SURGERY. Manila.—Organized in 1907. The faculty includes 16 professors and 8 assistants, instructors, etc., a total of 24. The course extends over five years. The Dean is Jose L. de Castro.

CANADA

The Dominion of Canada has nine medical colleges, all of which require a six-year course, including courses in physics, chemistry and biology. This course is practically equal to that in the colleges of the United States which require two years of college work for admission, including the science courses named.

Alberta

UNIVERSITY OF ALBERTA, FACULTY OF MEDICINE, Edmonton.—Organized in 1913. Offers all six years of the medical course. The faculty includes 30 professors and 50 instructors, assistants, etc., a total of 80. Fees for each year are $180. The Dean is Dr. Allan C. Rankin. The registration for 1923-1924 was 109. The twelfth session begins Sept. 29, 1924, and ends May 15, 1925.

Manitoba

UNIVERSITY OF MANITOBA FACULTY OF MEDICINE, Winnipeg.—Organized in 1883 as Manitoba Medical College; first class graduated in 1886, and a class graduated each subsequent year. The college transferred all its property to the University of Manitoba in 1919 and assumed the present title. The faculty includes 52 professors and 60 instructors, assistants, etc., a total of 112. The total fees for the five years, respectively ,are $180, $175, $185, $185 and $175. Matriculation requirements include two years of college work in the faculty of Arts and Science of a recognized university subsequent to the complete high school course required for entrance to the latter. The course extends over five years of eight months each. The Dean is Dr. S. Willis Prowse. Total registration for 1923-1924 was 230; graduates, 52. The next session begins Sept. 29, 1924, and ends May 29, 1925.

Nova Scotia

DALHOUSIE UNIVERSITY, FACULTY OF MEDICINE, Halifax, N. S.—Organized in 1867. Incorporated as the Halifax Medical College in 1875. Reorganized as an examining faculty, separate from the Halifax Medical College, in 1855. In 1911, in accordance with an agreement between the Governors of Dalhousie University and the Corporation of the Halifax Medical College, the work of the latter institution was discontinued and a full teaching faculty was established by the University. By an arrangement between Dalhousie University and the Provincial Medical Board of Nova Scotia, the final professional examinations are conducted conjointly by the university and the board, and candidates may qualify at the same time for their academic degrees and the provincial license. First class graduated in 1872. It has a faculty of 22 professors and 28 lectures and demonstrators, a total of 50. Requires matriculation, one year of Arts and a graded course of six years, including premedical courses in physics, chemistry and biology. The fees are $200 each year. The total registration for 1923-24 was 117; graduates, 32. The Dean is Dr. John Stewart. The next session begins Sept. 10, 1924, and ends May 12, 1925.

Ontario

UNIVERSITY OF TORONTO, FACULTY OF MEDICINE, Toronto.—Organized in 1843 as the Medical Faculty of King's College. Abolished in 1853. Reestablished in 1887. In 1902 it absorbed Victoria University, Medical Department, and in 1903 absorbed Trinity Medical College. The course of study covers six years of eight months each, the first two being devoted largely to physics, chemistry, biology and cultural courses in history, science and English. It has a faculty of 63 professors and 172 lecturers, associates, etc., a total of 235. The fees are $163 for the first five years and $191 for the sixth year. The Dean is Dr. Alexander Primrose. The total registration for 1923-1924 was 873; graduates, 208. The next session begins Sept. 30, 1924, and ends May 30, 1925.

QUEEN'S UNIVERSITY FACULTY OF MEDICINE, Kingston.—Organized 1854, first class graduated in 1855, and a class graduated each subsequent year. The faculty was originally a department of the university, but a separation took place in 1866, when the school was conducted under the charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the school again became an integral part of Queen's University. The faculty includes 24 professors and 27 assistants, instructors, etc., a total of 51. The fees for the six years are, respectively, $141, $146, $141, $155, $155 and $175. The last includes the fee of $30 for the M.D., C.M. degrees. The course covers six years of thirty teaching weeks each, the first including courses in physics, chemistry, biology, English and French or German. The total registration in 1923-1924 was 274; graduates, 65. The Dean is Dr. J. C. Connell. The next session begins Oct. 1, 1924, and ends May 20, 1925.

UNIVERSITY OF WESTERN ONTARIO MEDICAL SCHOOL, London, Ontario.—Organized in 1881 as the Western University, Faculty of Medicine; first class graduated in 1883, and a class graduated each subsequent year. Present title in 1923. The medical school has been under the control of the Board of Governors of the University of Western Ontario since 1913. The faculty numbers 61. Two years of premedical college work are required for admission, including courses in physics, chemistry and biology. The medical course covers four years of thirty-two weeks each. The total fees for the four years, respectively, are $155, $163, $163 and $183. The Dean is Dr. Paul S. McKibben. Total registration for 1923-1924 was 93; graduates, 25. The next session begins Sept. 23, 1924, and ends May 29, 1925.

Montreal

MCGILL UNIVERSITY, FACULTY OF MEDICINE.—Founded 1824 as Montreal Medical Institution; became the Medical Faculty of McGill University in 1829; first class graduated under the university auspices in 1833. No session between 1836-1839 owing to political troubles. In 1905 it absorbed the Faculty of Medicine of the University of Bishop College. The course consists of two premedical years, four medical years of eight months each, and a fifth year of hospital intern work. The faculty consists of 49 professors and 159 lecturers, etc., a total of 208. The total fees for each of the five medical years are $222; for the sixth year, $252. The total registration for 1923-1924 was 613; graduates, 166. The Dean is Dr. C. F. Martin. The next session begins Sept. 22, 1924, and ends May 29, 1924.

UNIVERSITY OF MONTREAL MEDICAL FACULTY, Montreal.—Organized in 1843, incorporated in 1845 as the Montreal School of Medicine and Surgery. In 1891, by act of parliament, the Medical Faculty of Laval University (organized in 1878) was absorbed. Present name, by act of Parliament, in 1920. A class was graduated in 1843 and in each subsequent year. The faculty numbers 81. The course extends over six years, including preliminary courses in physics, chemistry and biology. The total fees each of the five years, respectviely, are $207, $200, $242, $214 and $207. The Dean is Louis de Lotbieniere Harwood. The total registration for 1923-1924 was 155; graduates, 73. The next session begins Sept. 15, 1924, and ends June 15, 1925.

Quebec

LAVAL UNIVERSITY FACULTY OF MEDICINE, Quebec.—The Quebec School of Medicine, organized in 1848, became in 1852 the Medical Department of Laval University; first class graduated in 1855, and a class graduated each subsequent year. The faculty numbers 37. The fees are $135 each year. The course extends over five years, the first year including courses in physics, chemistry and biology. The Secretary is Dr. Arthur Vallée, Quebec. Total registration for 1923-1924 was 208; graduates, 23.

HOSPITAL INTERN YEAR

Medical Colleges

Ten medical colleges have adopted the requirements of a fifth year to be spent by the student as an intern in an approved hospital or in other acceptable clinical work before the M.D. degree will be granted. These colleges and the years when the requirement became effective for matriculants and graduates are as follows:

	Affects Matriculants	Affects Graduates
University of Minnesota Medical School.....	1910-11	1915
Stanford University School of Medicine.....	1914-15	1919
Rush Medical College (University of Chicago).	1914-15	1919
University of California Medical School.....	1914-15	1919
Marquette University School of Medicine.....	1915-16	1920
Northwestern University Medical School.....	1915-16	1920
University of Illinois College of Medicine.....	1917-18	1922
Loyola University School of Medicine.....	1917-18	1922
Detroit College of Medicine and Surgery.....	1919-20	1924
College of Medical Evangelists.....	1922-23	1927

Licensing Boards

The hospital intern year has been adopted as an essential qualification for the license to practice in eleven states, becoming effective in different years, as follows:

State Board of	Affects Student Matriculants	Affects All Applicants
Pennsylvania	1909-10	1914
New Jersey	1911-12	1916
Alaska	1912-13	1917
Rhode Island	1913-14	1917
North Dakota	1913-14	1918
Washington	1914-15	1919
Illinois	1917-18	1922
Michigan	1917-18	1922
Iowa	1918-19	1923
South Dakota	1920-21	1925
Delaware	1923-24	1928

The requirements both by medical schools and by state boards are overwhelmingly if not unanimously for the rotation service in general hospitals.

State Requirements of Preliminary Education

There are now forty-two states (counting Alaska Ter.) which have adopted requirements of preliminary education in addition to a standard four-year high school education. Of this number 39 now require the two year standard. These states, the number of college years required and the time the higher requirements became or become effective, are as follows:

State Examining Board of	One Year of College Work		Two Years of College Work	
	Affects Students Matriculating	Affects All Graduates	Affects Students Matriculating	Affects All Graduates
Alabama	.....	.....	1915-16	1919
Alaska	1914-15	1918	1918-19	1922
Arizona	1914-15	1918	1918-19	1922
Arkansas[1]	1915-16	1919	1918-19	1922
California	1915-16	1919	.....	....
Colorado	1908-09	1912	1910-11	1914
Connecticut[1]	1911-12	1915	.....	....
Delaware*	.....	....	.....	....
District of Columbia†	.....	....	.....	....
Florida	1914-15	1918	1918-19	1922
Georgia	.....	....	1918-19	1922
Idaho	.....	....	1915-16	1919
Illinois	1915-16	1919	1918-19	1922
Indiana	1910-11	1914	1911-12	1915
Iowa	.....	....	1911-12	1915
Kansas	1910-11	1914	1918-19	1922
Kentucky	1914-15	1918	1918-19	1922
Louisiana	1915-16	1919	1918-19	1922
Maine	1915-16	1919	1916-17	1920
Maryland	1914-15	1918	1918-19	1922
Massachusetts†	.....	....	.....	....
Michigan	1914-15	1918	1918-19	1922
Minnesota	.....	....	1908-09	1912
Mississippi	1915-16	1919	1919-20	1923
Missouri*	.....	....	.....	....
Montana	1914-15	1918	1918-19	1922
Nebraska*	.....	....	1918-19	1922
Nevada*	.....	....	.....	....
New Hampshire	1914-15	1918	1915-16	1919
New Jersey	1915-16	1919	1917-18	1921
New Mexico	1914-15	1918	1918-19	1922
New York	1917-18	1921	1918-19	1922
North Carolina	1914-15	1918	1918-19	1922
North Dakota	.....	....	1908-09	1912
Ohio*	.....	....	.....	....
Oklahoma	1914-15	1918	1917-18	1921
Oregon	.....	....	1920-21	1924
Pennsylvania	1914-15	1918	.....	....
Rhode Island	1914-15	1918	1918-19	1922
South Carolina	.....	....	1918-19	1922
South Dakota	1908-09	1912	1911-12	1915
Tennessee	1916-17	1920	1918-19	1922
Texas	1914-15	1918	1922-23	1926
Utah	1913-14	1917	1922-23	1926
Vermont	1913-14	1917	1918-19	1922
Virginia	1914-15	1918	1917-18	1921
Washington	1914-15	1918	1918-19	1922
West Virginia	1917-18	1921	1920-21	1924
Wisconsin	.....	....	1915-16	1919
Wyoming†	.....	....	.....	....

* Require a four-year high school education or its equivalent.
† No fixed standard.
1. The higher standards in Arkansas and Connecticut are evidently not enforced by the sectarian licensing boards of those states.

THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

The requirements for admission to and graduation from colleges holding membership in this association are 15 units of high school work and two years (60 semester hours) of college work.

CURRICULUM: The entire course of four years shall consist of not less than 3,600 hours, and shall be grouped in divisions and subdivided into subjects, each division to be allotted approximately the time, on a percentage basis, as shown in the following schedule:

1. Anatomy, including embryology and histology	14	–18½%
2. Physiology	4½–	6 %
3. Biochemistry	3½–	4½%
4. Pathology, bacteriology and immunology	10	–13 %
5. Pharmacology	4	– 5 %
6. Hygiene and sanitation	3	– 4 %
7. General medicine (neurology and psychiatry, pediatrics, dermatology and syphilis)	20	–26½%
8. General surgery (orthopedic surgery, urology, ophthalmology, otolaryngology, roentgenology)	13	–17½%
9. Obstetrics and gynecology	4	– 5 %
	76	– 100%
Electives	24	– 0 %

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The secretary-treasurer of the Association is Dr. Fred C. Zapffe, 3431 Lexington Street, Chicago.

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SATURDAY, AUGUST 16, 1924

MEDICAL EDUCATION—PROGRESS OF TWENTY-FOUR YEARS

For the twenty-fourth consecutive year, THE JOURNAL publishes, this week, statistics regarding medical education in the United States. During these years, the real progress made in medical education can be appreciated only by the comparatively few persons who, at the beginning of the campaign for improvement, were in close touch with the medical schools to a nation-wide extent. The progress, indeed, both in rapidity and in extent, has passed the highest expectations of those who began the campaign for improvement.

BEGINNING OF THE CAMPAIGN

Prior to 1900, it was generally known that conditions in medical education were bad, and that only a few of the medical schools were equipped to provide a comprehensive training in medicine. Little attention was called to these conditions, however, until the statistics in regard to medical colleges, students and graduates were published in the first Educational Number of THE JOURNAL, Sept. 21, 1901. It was known that very few of the medical schools were parts of recognized universities; that many were stock corporations conducted for the profit of their owners, and that in many of them entrance requirements were nominal or lacking. The statistics were based necessarily on reports and catalogues received directly from the medical colleges and, therefore, were presented from the most favorable point of view. Nevertheless, the conditions in medical education were shown to be so bad that energetic action would be required for their correction.

At that time there were 160 medical schools, in which were enrolled 26,417 students, of whom 5,444 graduated. It was the publication of such data, for two or three consecutive years, that led to the creation, in 1904, of a permanent committee of the American Medical Association—the Council on Medical Education—to centralize its efforts on this particular work. It was not until late in 1905 that the Council established an office at the headquarters of the Association.

PROGRESS FROM 1906 TO 1910

As a part of its function, the Council naturally took over the work of collecting and tabulating statistics relating to medical education. Investigation regarding medical education abroad revealed the significant fact that the United States had more than half the world's supply of medical schools, but that in educational standards very few of these could compare favorably with those abroad. Just how bad the existing conditions were, however, could not be known until in 1906 a further investigation, including an actual inspection of all medical schools, was made. Of the 160 schools then existing, scarcely thirty were even pretending to require a four-year high school education, while in more than a hundred, the entrance requirements were nominal or entirely lacking. In many of the institutions, graded courses of instruction were not being given, and in several the same schedule of lectures was followed alike for the three or four years of attendance that were required for the degree. At the lowest extreme, several institutions were found which were little more than diploma-mills. Only a few had hospitals in which medical students could gain access to a fair number of patients. A slightly larger number had outpatient departments or dispensaries wherein more than a scattering of patients was available for teaching purposes. There were a score or more, however, from which students were graduated without having had the opportunity to study patients either in dispensaries or in hospitals, and without having had laboratory work other than crude dissections and the simplest tests in urinalysis.

MEASURES FOR IMPROVEMENT ADVOCATED

At its first annual conference in 1905, the Council proposed two standards of medical education. One, which was for immediate adoption, suggested a four-year medical course of thirty weeks each, to be preceded by the completion of a four-year high school course, and an "ideal standard" for adoption, Jan. 1, 1910, suggesting that the minimum entrance requirement be increased to a year of college work devoted to physics, chemistry and biology. The Council's suggestions brought a prompt and enthusiastic response from the medical schools. In 1910, the high school education had been adopted as the minimum entrance requirement by more than a hundred medical schools, of which forty later required also one or two years of college work. Another remarkable occurrence was the rapid reduction in the number of medical schools. During the inspection of schools made in 1906-1907, the Council advocated that mergers be brought about in cities or states having two or more institutions. As a consequence, by 1910 the total number of medical schools had been reduced to 131, and, of the twenty-nine colleges that had ceased to exist, twenty-four had been merged with other institutions.

The classification resulting from the first inspection [1] was not published, but was read at the Council's educational conference and at the annual meeting of the American Medical Association. Each college also was notified in regard to its classification. Following the second inspection, which was made in 1909-1910, another classification [2] was prepared and this was published.

Early in 1909, at the urging of the Council, the Carnegie Foundation for the Advancement of Teaching consented to make a survey of the medical schools. The second tour of inspection, therefore, was made jointly by representatives of the Council and the Foundation. In its report, which was published in 1910, the Carnegie Foundation made no classification of medical schools, nor did it suggest any standards; but it did secure a wide publicity, which was of tremendous service in the later developments in medical education.

During 1908-1909, a careful study of the medical curriculum was made by a special committee of one hundred prominent educators appointed by the Council. This first comprehensive report on the medical curriculum was presented at the annual conference of the Council in April, 1909.[3]

PROGRESS FROM 1910 TO 1916

The year 1910 was important for several reasons. Besides being the year when the Carnegie Foundation issued its memorable report on medical education, and when the Council published its classification of medical colleges, it was also the year when the Medical Students' Register was established. This register was made possible through the splendid cooperation received from the majority of medical schools, and in it were kept, chronologically, the educational histories of medical students and the essential data for their identification. After the students graduate, their cards become a part of the Physicians' Biographical Index. This register has been of special value as a check over reports of physicians appearing for licensure before state medical examining boards. It provides a means of verifying the work of bona fide students, and aids in the exposure of impostors.

During the session of 1911-1912, a third complete inspection of all medical schools was made, resulting in the third classification.[4] At this time the institutions formerly rated in Class A were divided into two separate groups, Classes A and A plus. This division was necessary because of defects in certain matters which, although serious, were not deemed sufficient to warrant an immediate demotion into Class B. This action brought a prompt correction of the defects in most of the schools involved, so that the A plus classification was discontinued a few years later.

GENERAL ADOPTION OF HIGHER ENTRANCE REQUIREMENTS

The "ideal standard," already mentioned, could not be generally adopted in 1910, owing to the lack of four-year high schools in certain sections of the country, particularly in the West and South. Indeed, when the campaign for improvement of medical education began, very little effective work had been done in the standardization of general education. Among its other duties, the Council on Medical Education found it necessary to help in the dissemination of information in regard to the curriculums of high schools.[5] By Jan. 1, 1914, however, the development of high schools had progressed sufficiently to warrant the additional requirement of a year of college work as an essential for the Class A rating. By 1914, therefore, seventy-eight of the 106 medical schools then existing were requiring for admission one or more years of college work in addition to a four-year high school education, and thirty-four of these were voluntarily requiring two years of college work. Most of the medical colleges, also, had adopted more strict and reliable methods of verifying and evaluating students' credentials. Through the reports obtained for the Medical Students' Register, the degree of care with which entrance requirements were administered was known with fair accuracy, and any faulty methods or "paper standards" were promptly discovered.

In 1916, the entrance requirement essential for Class A medical schools was further extended to two years of college work, which became effective, Jan. 1, 1918. This was not a drastic ruling, since forty-six medical colleges and seventeen state licensing boards had already adopted that standard. The American Medical Association has voted that no higher requirement of premedical education is justifiable.

INCREASED FINANCES FOR MEDICAL SCHOOLS

Through the constant agitation for better conditions and the publicity given to the report of the Carnegie Foundation, the financial needs of medical education were brought to the attention of philanthropists, so that large gifts of money to medical schools became more frequent. This led to the securing of more and better college buildings; more and better equipped laboratories; more scholarships and endowed chairs, and the employment of more and better qualified all-time teachers, particularly in the laboratory departments. Of still greater importance, closer relationships were established between medical schools and large hospitals

1. Of the 160 medical colleges comprised in the first classification, eighty-two were in Class A, forty-six in Class B and thirty-two in Class C.
2. There were 135 medical colleges included in the second classification, of which seventy-four were in Class A, thirty in Class B, and thirty-one in Class C.
3. This was published in the American Medical Association Bulletin 5, No. 1 (Sept. 15) 1909.
4. Of the 118 medical schools included in the third classification, twenty-four were in Class A+, thirty-nine in Class A, twenty-four in Class B and thirty-one in Class C.
5. At that time the high school represented the only portion of general education that had been definitely standardized. In 1896, the Committee of Ten of the National Education Association, headed by President Charles W. Eliot of Harvard, published its famous report fixing definite schedules of study in the classical, Latin-scientific, modern language, and English courses of instruction in high schools. As high school schedules have been improved these have been included for their suggestive value in the Council's pamphlet for prospective medical students, "Choice of a Medical School."

by which a greater abundance of clinical material was available for teaching purposes. Not only were closer relations established with large hospitals, but more teaching hospitals entirely controlled by medical schools were built.

MEDICAL EDUCATION AND THE WORLD WAR

In 1917, when the United States entered the World War, the number of medical schools had been reduced to ninety-six; but of these, eighty-six had not only adopted higher entrance requirements but also had undergone marked improvements in other respects. For several years they had been graduating students trained under these better conditions—graduates who in large numbers entered the government medical services and had in charge the medical care of American soldiers and sailors.

The abundance of information collected in the Medical Students' Register was utilized by the war department as a check of the qualifications of those who applied for commissions. The information was of further service when the American Medical Association undertook the work of urging more physicians to enlist in the government medical services. The campaign for improvement which had made such rapid headway since 1901 was therefore of great service to the nation during the war.

SUMMARY OF PROGRESS MADE

During the last twenty-four years, medical education in the United States has been extensively improved, so that graduates now obtain a medical training in accordance with the greatly enlarged present-day knowledge of medicine. A large oversupply of medical schools, including many which were of low type, has been replaced by half as many greatly improved, well equipped institutions. The number of medical students was reduced from 28,142 in 1904 to 12,930 in 1919, but the number in the better equipped colleges was increased from 4 per cent. to 88 per cent. Since 1919, also, these better trained students have been increasing at the rate of more than a thousand each year, the total enrolment this year being 17,728, of whom 95 per cent. are in Class A medical schools. During the twenty-four years, the number of graduates from medical schools was decreased from 5,747 in 1904, of whom only 369 were from the better colleges, to 2,656 in 1919, of whom 94 per cent. were from the better equipped institutions. Since 1919, with the exception of the war class which graduated in 1922, the numbers graduating each year have been rapidly increasing. This year there were 3,562 graduates, of whom 94 per cent. were from the better equipped colleges.

GRADUATE MEDICAL EDUCATION

Three complete inspections have been made of all graduate and postgraduate medical schools, these being completed in 1916, 1920 and 1923. Based on these inspections, the "Principles Regarding Graduate Medical Education" [6] were prepared and in June, 1923, were adopted by the American Medical Association. Last year, a list of fifteen approved graduate medical schools was published. This year, the number has been increased to forty-four. Attention is particularly called, however, to the series of subjects [7] showing under each of the institutions in which approved courses of instruction are being offered. This information will be of assistance to physicians desiring to obtain graduate work in those subjects. The list at present is not large, but other subjects and institutions will be added as rapidly as they are investigated and found worthy of approval.

ACKNOWLEDGMENTS

In the publication of these statistics during the last twenty-four years, our acknowledgments are due to the officers of medical colleges and state licensing boards, both individually and in their national organizations, for their most prompt and generous cooperation. It was this cooperation which permitted advancements to be made in a few years which otherwise would have required as many decades to accomplish. The Carnegie Foundation for the Advancement of Teaching, and later the General Education Board, have been of great help, particularly in providing for the financial needs of medical education. The rapid reorganization of medical colleges and medical education in the United States has been no less marvelous, although perhaps less spectacular, than other great scientific achievements of the last twenty-five years.

FORMATION OF BILE PIGMENT WITHOUT THE LIVER

If the presence of the bile pigment bilirubin in the blood serum and the urine is to be taken as infallible evidence of hepatic disorder—either obstruction of the biliary ducts or some other liver disturbance—the characteristic coloring matter must have its origin in the hepatic tissues. This has long been accepted by almost all physiologists to be the case; and on this seemingly well founded assumption, the value of the diagnostic tests for bile pigment in the urine has been based. Indeed, the underlying belief in the exclusive rôle of the liver in the genesis of bile pigment has been so widely adopted and so universally taught that denial has seemed to be a scientific heresy that verged on extreme improbability, to say the least. THE JOURNAL also supported this view.[8] Jaundice has been made practically synonymous with hepatic disorder.

To Whipple and his collaborators in this country belongs the credit of protracted efforts to test the validity of the long current hypothesis and of combating its accuracy. In studying the jaundice that develops

6. These will be found on page 518.
7. "Graduate Courses in Medical Subjects," page 520.
8. Production of Bile Pigment Without Intervention of the Liver, editorial, J. A. M. A. 79: 558 (Aug. 12) 1922; Where Are the Bile Pigments Formed? ibid. 81: 2116 (Dec. 22) 1923. Whipple, G. H.: The Formation of Bile Pigments, ibid. 82: 910 (March 15) 1924.

in days after injections of hemoglobin or after poisoning with chloroform, Whipple and Hooper [9] noticed that animals bearing an Eck fistula, whereby the portal blood is diverted from the liver, nevertheless developed icterus similar to that induced in normal dogs under similar conditions. Even when the blood supply to the liver was further completely excluded by ligation of the hepatic artery, jaundice still appeared. Positive reactions for bilirubin were obtained, after injections of hemoglobin, in the blood and fat of dogs having only a head-thorax circulation. The authors naturally concluded that the liver could not be the exclusively potent factor in the conversion of hemoglobin to bilirubin.

It matters little now whether those who have approached the problem in similar ways have been unable to demonstrate an extrahepatic formation of bilirubin in every instance. A truly crucial experiment has been undertaken by several groups of investigators, most recently by Mann [10] and his co-workers. They have succeeded in removing the liver completely from animals and keeping them alive for many hours. Under such conditions, a yellow pigment giving a positive test for bilirubin accumulates progressively in the urine, blood plasma and fatty tissues. The gradual augmentation of the color, together with the fact that it is not found in the plasma immediately following the hepatectomy, makes it reasonably certain that the pigment is not merely squeezed from the liver at the time of the operation. The amount found is too large to have come from stored pigment or from the gastrointestinal tract, which, as a matter of observation, becomes pigment free in a short time after liver ablation. As the pigment appears even when both liver and spleen are removed, the latter organ also is not necessary for its formation. Furthermore, the jaundice occurs when no blood is present in the peritoneal or any other serous cavity, so that the cells lining these spaces are likewise not essential to the pigment elaboration. In fact, the latter does not seem to be dependent on any of the intra-abdominal organs.

In view of the now known facts, it is difficult to escape the conclusion that the pigment bilirubin, so characteristic of bile, can be formed by some organ or tissue without the intervention of the liver. The Rochester physiologists [10] are of the opinion that there is only one possible source of bilirubin; namely, hemoglobin. They assert that, although the rate of formation of bilirubin after hepatectomy has been less than the rate of excretion of bile pigment from the normal liver, it has been formed at a rate that would justify a query as to how much of the bile pigment normally is formed by the liver and how much elsewhere in the body. Presumably the liver must henceforth be considered, to some extent at least, as an excretory organ so far as bile pigment is concerned, a portion of the latter being of extrahepatic origin. According to Mann, Bollman and Magath, the logical site for both the destruction of worn out, functionless erythrocytes, and the disintegration of hemoglobin would be the place where the greatest functional stress is placed on the erythrocytes; that is, in the capillaries. This, however, is mere speculation at present. The outstanding contribution is the demonstration that the liver is not indispensable for the formation of bile pigment. Henceforth this must be reckoned with.

9. Whipple, G. H., and Hooper, C. W.: J. Exper. Med. **17**: 593, 612, 1913.
10. Mann, F. C.; Bollman, J. L., and Magath, T. B.: Studies on the Physiology of the Liver, IX, The Formation of Bile Pigment After Total Removal of the Liver, Am. J. Physiol. **69**: 393 (July) 1924.

Current Comment

REQUIRE EQUALLY HIGH QUALIFICATIONS OF ALL WHO PRACTICE MEDICINE

Statistics published this week show that the medical schools of the United States are training physicians in accordance with the present-day extensive knowledge of medicine. The turning out of well trained physicians is only one factor, however, in securing for the public the benefits of modern scientific medicine: adequate legal restrictions must be provided against ignorant or inadequately trained doctors. Such legal restrictions, indeed, have now been established in all but eight states [1] for those generally regarded as "physicians," since medical practice laws in most states have established for physicians the educational standards adopted by our better medical schools. Unfortunately, however, under various pretexts and by persistent hammering at legislatures, cultists of various types have obtained legal authority to treat the sick on qualifications lower than those required of physicians. These irregular practitioners assume a personal responsibility for the care of the sick and act as substitutes for the physician; and, since they do not have the physician's qualifications either educationally or professionally, they practice under false pretenses, and are a menace to the health and lives of their patients. As medical science has advanced during the last few decades, this menace has been constantly increasing. Delicate and highly technical procedures are being employed in the treatment of disease which, in the hands of unskilled or ignorant practitioners, are exceedingly dangerous to the patient. Modern medicine also has brought out a specific treatment for each of several diseases, and a failure to use this treatment may result in disaster to the patient. It is time that the dangers from untrained or incompetent practitioners should be generally recognized and that medical laws should be strengthened to safeguard the public against them. The legal phases of this problem have been clearly presented [2] by Harry Eugene Kelly of the Chicago bar, who supports his statements with an array of court decisions that greatly add to their force. In the eyes of the law, according to Kelly, the word "physician" includes every one who assumes the responsibility for the care of the

1. See tabulation, "State Requirements of Preliminary Education," page 531.
2. Kelly, H. E.: Regulation of Physicians by Law, A. M. A. Bulletin **19**: 179 (June, Part 2) 1924. A copy of this Bulletin will be mailed for 10 cents.

sick and the injured; furthermore, the educational and professional qualifications required of physicians should apply with equal force to all who are granted legal authority to practice the healing art. The training given in medical schools has not yet reached perfection, but medical students are now being given a far better knowledge of the causes and treatment of diseases than was possible twenty or more years ago. The greatest problem of today is how to secure for the entire public the widest possible benefits of modern scientific medicine. An important step toward the solution of this problem would be the adoption in all states of laws requiring reasonable educational qualifications of all who are to practice medicine.

BLOOD SUGAR AND NERVOUSNESS

The effects of overdosage with insulin have been brought emphatically to the attention not only of experimenters in the physiologic laboratories but also of many clinicians who were pioneers in the use of this substance in the treatment of human disease. The untoward phenomena are evidently closely associated with the lowered content of glucose in the blood; for any procedure, dietary or other, that overcomes the hypoglycemia brings prompt relief. Doses of insulin that lead to marked hypoglycemia may bring about irregularities of the heart, a slight decline in mean arterial blood pressure, and a lowered carbon dioxid capacity of the blood, among other symptoms, which may include nervousness and prostration.[1] These are manifestations exhibited in certain types of nervous disorder that involve asthenia, anorexia, tachycardia, palpitation, and digestive disturbances commonly thought to be psychogenic in character. Parker and Finley[2] of the College of Physicians and Surgeons, New York, have accordingly ventured to treat selected patients with glucose, particularly in cases in which the blood sugar content and the carbon dioxid capacity of the blood encouraged this. With daily sugar intakes of from 40 to 100 gm., the peculiar symptoms were noticeably relieved in a sufficient number of persons to justify further therapeutic attempts in this direction. Many investigators have attempted to discover a metabolic cause for certain psychogenic symptoms; it may be worth while to reconsider the carbohydrate factor in this connection.

VITAMIN B AND BASAL METABOLISM

Among the numerous and varied potencies that have been attributed to vitamins, their assumed ability to promote metabolism in some way has gained considerable credence. This applies in particular to vitamin B, which became associated not long ago in the popular mind with yeast and products derived from yeast. The vague conceptions of developing "pep" in persons—to use current slang applied to health—and of "speeding up" the metabolism have been introduced into discussions of the potentialities of the vitamin on the basis of rather indefinite evidence. It is true that an experimental animal subsisting on a diet deficient in vitamins will presently show symptoms of listlessness and physiologic inertia, which are readily relieved and dissipated by administration of vitamin-bearing foods. Restoration of vigor does not, however, necessarily involve a change in the metabolic rate. Deuel and Weiss[1] of Cornell University Medical College have carefully determined the basal metabolism at frequent intervals in susceptible animals during a regimen that was essentially devoid of vitamin B. The diminution in basal heat production was no greater than that which would be expected from the decreased body weight due to a lowered food intake. Both before the onset of the characteristic symptoms of polyneuritis and after their relief by administration of products bearing vitamin B, the basal metabolism was remarkably constant, thus indicating that the vitamin deficiency per se does not influence heat production. Furthermore, an augmentation of vitamin B intake in normal animals does not bring about any "speeding up" of the chemical processes, so far, at least, as they would be revealed by the metabolic rate. These carefully controlled findings should put an end to the statements, lately appearing in the European continental literature in particular, that vitamin B somehow directly promotes oxidation in the body. The preeminent physiologic importance of vitamins may be recognized without accepting unfounded hypotheses to account for their potency.

THE SIGNIFICANCE OF NITRITURIA

The occasional occurrence of nitrates and nitrites in human urine has long been recognized by physiologic chemists, having been brought to public attention sixty years ago by Schoenbein. Its possible significance has been debated. Drinking water often contains both these types of nitrogen compounds, and because of this it has been held responsible for their absorption and excretion through the kidneys. Modern bacteriology has demonstrated the ready production of nitrite from nitrate through the action of certain reducing microorganisms, so that the appearance of nitrite might be explained on the basis of bacterial intervention when this is a possibility. A number of recent studies, notably those of Paul and Chapin[2] in the Ayer Clinical Laboratory of the Pennsylvania Hospital, Philadelphia, point to the presence of nitrate-reducing bacteria in the urinary tract as the commonest cause of nitrituria. When care is taken to avoid microbial contamination from the air, the urine of healthy persons rarely gives a reaction for nitrite. This applies to the great majority of general hospital patients. Nitrites may develop if the urine specimens are inoculated with strong nitrate-reducing organisms. On the other hand, the nitrite test is frequently obtained in case of urinary infection, particularly if the reaction of the secretion is favorable

1. Banting, F. G.; Campbell, N. R., and Fletcher, A. A.: Brit. Med. J. 1:8 (Jan. 6) 1923. Edward, D. J.; Page, I. H., and Brown, P. K.: Proc. Soc. Exper. Biol. & Med. 21:170, 1924.
2. Parker, J. T., and Finley, C. S.: Some Results Obtained by the Treatment of Nervous Phenomena with Glucose, Proc. Soc. Exper. Biol. & Med. 21:517 (May) 1924.

1. Deuel, H. J., Jr., and Weiss, Robert: The Basal Metabolism in Vitamin B Deficiency, Proc. Soc. Exper. Biol. & Med. 21:456 (May) 1924.
2. Paul, J. R., and Chapin, W. E.: Nitrituria in Infections of the Urinary Tract, Bull. Ayer Clin. Lab. Pennsylvania Hosp. 8:23 (May) 1924. Weltmann: Wien. klin. Wchnschr. 35, 1922. Lowenstein: ibid. 37:142, 1924.

to the form of decomposition involved. If, as the recent observations indicate, the presence of nitrites in freshly passed urine is most commonly due to the growth of nitrate-reducing bacteria within the urinary tract, the test for nitrites in the urine may be useful as an aid to the diagnosis of urinary infections caused by nitrate-reducing bacteria. Paul and Chapin believe that it may prove of particular value in cystoscopic work and in the course of a differential kidney study; but whenever used, its value is limited to those infections caused by nitrate-reducing organisms. Apparently, it is such organisms that are involved in a large number of bladder and kidney infections.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—T. H. Sewall, Birmingham, has been appointed director of the bureau of epidemiology of the state department of health.

"Physcultopractor" Convicted.—John Vinson of Gadsden, a physical culture devotee, was found guilty by a jury of practicing medicine without a license, July 22, and fined $150, it is reported. An indictment in this case was secured by the Marshall County Medical Society.

Change in Code Affecting the Professions.—The section of the new code dealing with professional practice which goes into effect in Alabama, August 17, has been rewritten by the code committee. Heretofore, persons found guilty of practicing a profession without a certificate were required, after having been indicted, to be tried by a jury in a criminal court. In the future such practitioner or professional person will have to face quo warranto proceedings in a civil court and before a judge, and will have to show cause for practicing without a license.

ARKANSAS

Tablet to Dr. Welch.—The Arkansas Medical Society, at its forty-ninth annual meeting, Fayetteville, May 20, passed a resolution to appropriate a sum not to exceed $200 to erect a suitable tablet to be placed on the lawn of the city hospital, Fayetteville, in memory of Dr. Welch, the first president of the state medical association.

CALIFORNIA

Chiropractor Loses Suit.—Jasper D. "Backbone" Butler, chiropractor, Oakland, was recently sued for $15,500 by a patient named Rosando Vasquez, who testified that his leg was broken by the "rough and negligent treatment" of Butler. The jury deliberated ten minutes, then awarded the patient $2,607.

Licenses Revoked.—The state board of medical examiners reports that the license to practice medicine of Dr. Olaf A. Kvello, Hemet, was revoked, July 10, because he had failed to comply with the requirements of his probation, and that the license of Dr. Curt O. Dietsch, Los Angeles, was revoked, July 6. Dr. Dietsch was found guilty, at a hearing before the board, Feb. 16, 1921, of performing an illegal operation.

Questionable Diplomas.—The state board of medical examiners has received a photostatic copy of a blank diploma issued by the "College of Medical and Drugless Sciences of Southern California—Department of Medicine and Surgery," which diploma confers the degree of Doctor of Medicine. It is understood that this institution is operated by Jules Palotay, a graduate of the Chiropractic School and licensed as a drugless practitioner in Los Angeles. The board has also received a photostatic copy of a diploma of the "College of Medical and Drugless Sciences of Southern California—Naturopathic Department," which diploma bears the name of James R. Simpson, dated Los Angeles, June 29, 1924, but without the signature of either the secretary or president and dean, also without the seal of the institution.

COLORADO

State Board Orders Olives Confiscated.—It is reported that more than 500 cans of ripe olives, alleged to be the same brand that led to the death of four persons at Cody, Wyo., two weeks ago (THE JOURNAL, August 9, p. 447), were confiscated by the health department at Pueblo on instructions from the state board of health. The olives, found in four retail stores and one wholesale house, had been shipped to Pueblo direct from Oroville, Calif., where they were packed.

CONNECTICUT

Hospital News.—The president of Stamford Hospital, Stamford, announces that plans are being made for the erection of a $600,000 building.

Laboratory Moved.—The state department of health's bureau of laboratories has been moved to Hartford. All material for examination should now be sent to the Bureau of Laboratories, Hartford, Postoffice Box 1001.

DELAWARE

Health Education in Public Schools.—The department of public instruction has for two years carried on a nutrition program in the public schools, confined chiefly to the educational phases of nutrition. A group of children who were 8 per cent. or more underweight were selected. Twelve girls were then trained by giving them twelve lectures on twelve health rules, as for example, What Shall I Eat for Breakfast? Then twelve weeks were set aside in which these girls went to the grade rooms and lectured to the pupils on the particular health rule that they had prepared. At the same time, printed health matter was distributed under the direction of domestic science teachers. At the end of the twelve week period the groups of pupils were weighed monthly, and a chart was kept for each child, on which was the height, actual weight, normal weight and a column for sickness. A summary of the results for 1923, made by the home economics department, shows that 1,247 children who were 8 per cent. underweight were taught the rules of proper nutrition; and that 1,015 of these children gained 2,660 pounds in twelve weeks, an average of 2.6 pounds per child. One hundred and forty-six children lost an average of 1 pound, owing probably, it was said, to an epidemic of measles, influenza and colds during the time the program was in operation. One hundred and fifty-four children attained normal weight. The report for the last school year is not yet complete, but the results appear to be about the same as for 1923.

DISTRICT OF COLUMBIA

Physician Held.—Dr. Edward B. Preis, Washington, held on charges of illegally possessing narcotics, was committed to jail, July 30, in default of $1,000 bond, it is reported. Dr. Preis' narcotic license was surrendered to the government in April, 1922, after an investigation by federal agents.

FLORIDA

Hospital News.—A new $25,000 addition will be made to the nurses' home of the Jackson Memorial Hospital, Miami. ——A bond issue was recently made for the erection of a $600,000 hospital building at Tampa.——The Polk County commissioners have decided to issue $100,000 bonds for a county hospital and farm.——The Marvin Smith Sanitarium, Jacksonville, has been sold to the Home for the Aged.

GEORGIA

Lye Legislation.—At the recent meeting of the Medical Association of Georgia at Augusta, the resolution relative to the labeling of lye was adopted. Pennsylvania and Florida have passed laws that require the proper labeling of caustic acid and alkali preparations.

Physicians in Court.—In the case of Dr. Lemuel E. Thornton, Fitzgerald, arrested, July 16, on an indictment by the grand jury for involuntary manslaughter which grew out of an alleged illegal operation, it is reported, the jury was discharged after nineteen hours deliberation and a mistrial declared by the judge.——Dr. Roderick D. McLeod, Lyons, was sentenced, July 16, it is reported, by Judge Barrett in the United States District Court to serve one year and a day in

the federal penitentiary for violation of the Harrison Narcotic Law.

Personal.—Dr. Sam A. Anderson, Macon, has been elected health officer by the Baldwin County board of health to succeed the late Dr. George L. Chapman, Milledgeville.——Dr. Eugene E. Murphey, Augusta, has been reelected president of the board of health of Augusta. This is Dr. Murphey's fifth term as president of the board.——Dr. Clara Benson, formerly pathologist to the Henry Ford Hospital, Detroit, has been appointed pathologist to the Macon Hospital, Macon. ——Dr. Andrew Fletcher Quillian, Commerce, has been appointed physician to the federal penitentiary.

ILLINOIS

Hospital News.—It is planned to erect a $50,000 hospital building at Benton in the near future.——The Burnham Hospital, Champaign, has been taken over by the city as the result of a recent vote.——Bids have been closed for the erection of a $150,000 addition to the Wabash Railroad employees' hospital at Decatur.

Another County Health Department.—Wabash County has completed arrangements for creating a full-time health department on an annual budget basis. A full-time medical director will be employed to assume charge of the work. This is the second county, the other being Crawford County, to establish a health unit by the cooperative efforts of the state, the federal government and the International Health Board of the Rockefeller Foundation.

Chicago

Outpatient Station for Seamen.—The U. S. Public Health Service has arranged to extend its relief work in South Chicago by the establishment of an outpatient relief station at 3018 East Ninety-First Street. Merchant seamen from the vessels docking in that vicinity will now be able, when sick or injured, to secure medical relief. Patients needing hospital care will be sent to the Marine Hospital, 4141 Clarendon Avenue, under which the new station will operate as a branch.

Rush Medical Building Being Wrecked.—The old Rush Medical College building at Harrison and Wood Streets, erected in 1875, is now being wrecked, to be replaced by the Rawson Laboratory of Medicine and Surgery, the construction of which is part of the expansion program of the University of Chicago. The new structure, which will be five stories high and cost about $500,000, will house the Central Free Dispensary and the classrooms, and be connected with Senn Memorial Hall and the Presbyterian Hospital.

IOWA

Society News.—Dr. Charles F. Starr, Mason City, was recently elected president of the Austin Flint Cedar Valley Medical Society; Dr. John McDannel, Nashua, vice president; Dr. William E. Long, Mason City, treasurer (reelected), and Dr. Leonard A. West, Waverly, secretary.——At the twenty-seventh annual session of the State Society of Iowa Medical Women at Des Moines, recently, the following officers were elected: president, Dr. Jane Wright, Clear Lake; vice president, Dr. Grace Doane, Des Moines; secretary, Dr. Eleanor Hutchinson, Woodward, and treasurer, Dr. Helen Johnston, Des Moines.

Personal.—Dr. Glen W. Doolen, Davenport, has been appointed county physician of Scott County to succeed Dr. George Braunlich, Davenport, resigned.——Dr. Aura J. Miller, for three years assistant pathologist at the university hospital, Iowa City, received an appointment with Dr. Simeon B. Wolbach at the Medical School of Harvard University, Boston, effective July 1.——Dr. Junious E. Crouch, who has been at the Veterans' Hospital at Knoxville for the last three years, has resigned on account of his health.——Dr. Hans Hansen, Logan, has been appointed medical officer in charge of the new Veterans' Bureau Hospital at St. Cloud, Minn. Dr. Hansen served with the Eighty-Eighth Division during the World War, and lately has been in charge of a veterans' hospital in New York.

KANSAS

Personal.—Dr. Jacob J. Entz, Wichita, has been appointed state epidemiologist to succeed Dr. Clarence H. Kinnaman, Topeka. Dr. Entz is a member of the state board of health.

Health Survey Postponed.—A health survey of Kansas City, by Dr. Watson S. Rankin, Raleigh, N. C., and Dr. Samuel J. Crumbine, Topeka, of the American Child Health Association, which was to have started July 28, has been postponed until early in the fall. The board of health will announce the date later.

KENTUCKY

Physicians Held to Grand Jury.—It is reported that Drs. M. W. Hyatt and William T. Barnette, both of Springfield, charged with violating the Harrison Narcotic Law, have been held to the federal grand jury in Louisville.

State Board to Inspect Olives.—It is reported that the state board of health has called on all stores where ripe olives are sold, to stop selling such olives until they have been inspected by an agent of the state board of health. The object of this action is to prevent food poisoning by olives which have been improperly preserved.

LOUISIANA

Loss Due to Anthrax.—The executive officer of the Louisiana livestock and sanitary board stated that 20,000 head of livestock have been lost to the state in the epidemic of anthrax this summer, which is the worst the state has had since 1901, infection having been reported in forty-three of the sixty-four parishes. The loss amounts, it is said, to about $1,500,000.

New Tuberculosis Society.—The officers of the new antituberculosis organization, incorporated as the Tuberculosis and Public Health Association of Louisiana, are: president, Dr. William H. Seeman, New Orleans; vice presidents, Drs. Hector E. Bernadas, New Orleans, and Julius Dupont, Houma; secretary, Miss Anna Kennedy, and treasurer, W. R. Irby. The purposes of the association, according to its charter, are the study of tuberculosis; dissemination of knowledge concerning the disease; investigation of its prevalence in Louisiana; publication of useful data; securing of proper legislation for the prevention and relief of tuberculosis; cooperation with public authorities and various organizations in tuberculosis work; encouragement of the establishment of sanatoriums, and the promotion of community health.

MARYLAND

Personal.—Raymond Pearl, Ph.D., Johns Hopkins University Medical School, Baltimore, and Leon J. Cole, Ph.D., of the bureau of animal industry, were among the speakers at the Scottish Cattle Breeding Conference, Edinburgh, July 7-12, which is said to be the first international meeting of its kind.

New City Hospital Will Open September 1.—Six buildings of the municipal hospital at Montebello, the nucleus of the new Baltimore General Hospital, will be opened, September 1. The structure and equipment have cost about $900,000. The hospital for communicable diseases has a capacity of 110 beds, including thirty-five private rooms, which can be increased to 140 beds in an emergency. There will be a resident staff of five physicians, the superintendent, and twenty-five nurses. Treatment will be free to residents of Baltimore. Accident cases will not be received. Persons with communicable diseases who desire may engage private rooms, but the policy will be not to encourage pay patients. The group consists of the main hospital building, administration building, nurses' home, laundry with servants' quarters, service building, garage and power house. Dr. Birkhead Macgowan will be superintendent of the group. Sydenham Hospital, the present hospital for communicable diseases, of which Dr. Macgowan is now head, will be turned over to the supervisors of Baltimore city charities as part of the Bay View group.

New Endowment for Johns Hopkins University.—A survey begun in 1920 in connection with the close, in 1926, of Johns Hopkins University's first half century includes a series of projects ultimately involving the expenditure of $50,500,000, of which $20,800,000 is to be devoted to the medical school and hospital and the school of hygiene and public health. Daniel Willard, president of the Baltimore and Ohio Railroad and chairman of the committee to finance certain developments at the university, has announced a program involving $16,350,000 for education and research. Toward this program, $8,885,000 has been raised, including $400,000 from the General Education Board for a pathologic laboratory; $400,000 from Mrs. Lucy Wortham James for a woman's clinic; $2,000,000 from the Carnegie Corporation for a new dispensary; $2,000,000 from Mr. and Mrs. Henry Phipps, the General Education Board, Edward S. Harkness and others for the Phipps Psychiatric Clinic; $3,500,000 from the General Education Board for the expansion program of the medical school, and $85,000 from graduates of the School for Nurses for endowment of that school. According to *Science*, the endowment of this university, $19,386,702.91, is exceeded only by that of Harvard, Columbia, Chicago, Yale and Stanford. Its present assets include $10,974,934.08 for the hospital and $23,857,021.84 for the university.

MASSACHUSETTS

License Revoked.—The board of registration in medicine conducted a hearing, July 17, 1924, at which it decided to revoke the license of Dr. Percy A. Shurtleff, West Springfield, it is reported. An advertisement in the local paper set forth that the "electromedical doctors" were prepared to treat the sick by certain methods, and in support of that claim certificates of alleged benefits were also published. An investigation by members of the Academy of Medicine of Springfield found Dr. Shurtleff and a Dr. Coll at the office of the "electromedical doctors." The board of registration specified two causes for action: association with an unregistered practitioner in carrying on the practice of medicine, and fraud in dealing with persons who asked for diagnosis. The license was revoked on the first cause and the question of fraud is on file to be taken up if occasion requires. Dr. Coll, being unregistered, is beyond the jurisdiction of the board but within that of the courts.

MICHIGAN

Hospital News. — The Negaunee Hospital, Negaunee, which was damaged by fire, March 30, has been reopened. Drs. John H. Andrus and Horace W. Sheldon are the owners.

Scarlet Fever Epidemic.—It is reported that an epidemic of scarlet fever has been present in Flint, and that on August 1 the number of cases was fifty-six. There are said to be also about fifteen cases in Mt. Morris.

Ferris Institute Reorganized.—Dr. W. T. Dodge, Big Rapids, former president of the Michigan State Medical Society, has been elected president of Ferris Institute, which school has been reorganized on an endowment basis as a memorial to Senator Woodbridge N. Ferris.

University Appoints Hospital Director. — Dr. Harley A. Haynes, Lapeer, has been appointed director of the University Hospital, Ann Arbor, to succeed Dr. Christopher G. Parnall, whose resignation became effective, June 30. Dr. Haynes graduated from the Homeopathic Medical School of the University of Michigan in 1902, and since 1912 has been medical superintendent of the Michigan Home and Training School at Lapeer.

MINNESOTA

Personal.—Dr. Walter F. Bleifuss, Rochester, for the last five years deputy city health officer, has tendered his resignation to be effective October 1.

Smallpox in Minnesota.—According to the state board of health, there have been 193 cases of malignant smallpox with forty deaths in the state since January 1. The disease first appeared at Duluth and spread to eight other sanitary districts in St. Louis County and to Carleton, Aitkin, Martin and Lake counties, and recently to Morrison and Stearns. Of the forty deaths from malignant smallpox, thirty-four of the patients had never been successfully vaccinated. The other six had been vaccinated more than seven years before. Of the 193 cases, only two patients, neither of whom died, had been vaccinated less than seven years before. It is especially interesting to note that two of the patients who died had smallpox in childhood. In addition to the malignant smallpox, Minnesota has had 1,420 other cases of smallpox reported as nonmalignant. There have been eleven deaths in this group among the unvaccinated patients, but no deaths among patients who had ever been vaccinated. The state board of health points out that the first case of malignant smallpox was that of an itinerant laborer, in Duluth, who developed symptoms ten days after entering the state from Canada, and that his prodromal symptoms were at first thought to be due to an injury received about this time. Reports from various parts of the country show that frequently the first cases of malignant smallpox in a community are diagnosed as purpura hemorrhagica, scarlet fever or measles. Compulsory vaccination was abandoned in Minnesota in 1903, and a large part of the population now is unvaccinated. The state board warns that unless the people become protected against smallpox through vaccination, a serious epidemic may be expected.

MISSISSIPPI

University News.—At a meeting of the board of trustees of the University of Mississippi, July 29, Dr. Joseph O. Crider, assistant dean of the school of medicine, was elected dean; Mr. Lloyd E. Thatcher, of the department of zoology, University of Michigan, was elected professor of biology and embryology, and Mr. T. E. Wilson, Jr., was elected acting assistant professor of histology and physiology.

MISSOURI

Physician Sentenced.—It is reported that Dr. Leon Hurwitz, Joplin, has been denied a rehearing by the United States court of appeals and that he must serve a term of three years in the penitentiary and pay a fine of $1,000 for violating the Harrison Narcotic Law. Dr. Hurwitz was convicted on two counts on the same charge in the federal district court at Joplin, in June.

St. Louis Enlarges Hospital Social Service.—The board of aldermen of St. Louis recently passed an ordinance authorizing the addition of ten social workers to the social service department of the city hospitals. The ordinance provides for a director and staff to investigate the social conditions of patients with regard to prevention of disease, suitability of their home environment for convalescence, and to determine whether they are entitled to free medical and hospital treatment.

Hospital News.—Dr. John M. Frankenburger, Kansas City, has been appointed superintendent of the general hospital of that city to succeed Dr. William L. Gist who resigned. The hospital and health board have also accepted the resignations of the night superintendent and two laymen without appointing successors to fill their positions.——St. Mary's Hospital, St. Louis, was dedicated, June 10. This is the ninth hospital to be opened by the Sisters of St. Mary, who originally came from Germany in 1871. The new institution is on an 18-acre tract and was erected at an expenditure of $1,600,000. It has a capacity of 300 beds, which in emergency can be doubled. Dr. William T. Coughlin is surgeon-in-chief.——A dormitory at the home for neglected and delinquent children at Carrollton will be erected at a cost of $50,000.

NEW YORK

Measles Closes Camp.—Camp Quinipet, maintained for boys and girls on Long Island, located on Stearn's Point, has been closed for the season owing to an outbreak of German measles. The children who contracted the disease are being cared for at the camp hospital.

Hospital News.—The three-story addition to the Nyack Hospital, Nyack, will be erected at a cost of $190,000.——Work will soon start on the construction of a building at St. Joseph's Hospital, Syracuse, for which $244,000 was obtained recently in pledges.——Ground has been broken for an addition to the City Hospital, Hudson.

Information Wanted.—The state department of health desires information concerning the whereabouts of a person who is distributing among the farmers "an almost priceless work" designed to keep "men, women and children away from the doctor," for $20. The distributor, "Mrs. Witt," is said to be posing as an agent of the state department of health.

New York City

Society Buys Home.—"The Mansion" on the Colonial Road has been purchased as a home for the Bay Ridge Medical Society.

Illegal Practitioner Arrested.—Dominick Stiro, with offices at 8684 Twenty-Fifth Avenue, has been arrested and held in $500 bail for practicing medicine without a license. He examined a policewoman and charged her $5. Stiro, it is reported, has neither a diploma nor a license and is by training a barber.

Memorial to Dr. Mulcahy.—Physicians of Far Rockaway and the vicinity have formed a committee to seek funds for St. Joseph's Hospital, Far Rockaway, which will be applied to a memorial for the late Dr. William L. Mulcahy in recognition of his services to humanity. The memorial will take the form of a maternity and a children's ward, the cost of which will be about $200,000.

Sex Education in City Schools.—The division of visual instruction recently invited the division of venereal diseases of the state health department to sponsor illustrated lectures on sex hygiene. The lectures were given by a representative of the U. S. Public Health Service during May and were illustrated by the twelve-reel film "The Science of Life." Sixty-one exhibitions were given to more than 40,000 pupils.

St. Mark's Hospital Appeals for Funds.—St. Mark's Hospital, which serves one of the most overcrowded sections on the lower East Side, is making a plea for funds to meet the growing demands made on the hospital. St. Mark's has embarked on a building program, which contemplates the expenditure of $1,250,000. The new construction is being conducted so as not to interfere with the running of the hospital.

During 1923, the hospital cared for 4,851 bed patients, and the dispensary was used to the extent of 28,411 visits.

Home for Convalescent Children.—The Children's Aid Society announces plans for the immediate construction of a home for convalescents in the Westchester hills near Valhalla. Boys between 10 and 16 years of age will be taken there from hospitals in New York City to recover from major operations and serious illness. Sixty acres of land have been donated to the society by Dunlevy Milbank, who in addition to the buildings now on the land, has given funds for a new building. The home will accommodate about 500 boys a year.

United Hospital Fund.—The fifty-six hospitals of the United Hospital Fund during 1923 received a total income of $17,306,152 of which 68 per cent. was earned by hospital services rendered. Voluntary gifts amounted to $2,383,844. All but a small part of the income was devoted to actual service for the 201,271 patients cared for in these hospitals, of whom 40,131 were treated free of charge. The United Hospitals in addition cared for 714,963 outpatients, who made 2,547,211 visits to the hospital dispensaries. The year's work also included 41,935 ambulance calls.

OHIO

New Inter-County Society.—The recently organized Inter-County Medical Society, comprising Greene, Clinton, Warren, Highland and Fayette counties, will hold its first meeting, September 24, at Lebanon.

Personal.—Dr. William B. Robinson, Mount Gilead, has been appointed, by the governor, as a member of a committee to devise plans for the rehabilitation of the northern part of the state recently devastated by a tornado.——Dr. John Dudley Dunham, Columbus, was recently appointed professor of medicine in the Ohio State University College of Medicine.

Chiropractors Lose Second Appeal.—Chiropractors William J. Ryan, Emma C. Stricker, Herman J. Lohman and Frank J. Downey, all of Cincinnati, who were recently fined by the municipal court on charges of practicing without a license, lost their second appeal, August 4, when the court of appeals handed down a decision affirming the judgment of the municipal court and that of the common pleas court, which had affirmed the municipal court's action.

Fairs to Feature Health Work.—The Ohio state fair, and at least twenty county fairs, will feature health exhibits this fall through the cooperation of the state and county health departments. The state fair health exhibit will be conducted by the state health department with the cooperation of the department of agriculture and the adjutant-general's department. It will comprise moving pictures of health work, lectures, placards, posters, literature on sanitation and disease, and an opportunity to talk with members of the staff of the state health department on health topics. The growth of interest in health in the state is indicated by the fact that last year only four counties arranged for health exhibits at their local fairs. The additional counties have been stimulated to do so by the state fair health exhibit.

Hospital News.—The buildings of the new Children's Hospital, Columbus, were formally dedicated, June 16. Dr. Joel E. Goldthwait, Boston, was the principal speaker.——Contracts for the new Allen Hospital at Oberlin College, to be erected in honor of Dr. Dudley P. Allen, a former president of the Ohio State Medical Society and professor of surgery at the Western Reserve University School of Medicine, Cleveland, have been let and the building will be ready for use about next February. Two $50,000 gifts for this hospital were a nucleus for the endowment and building funds. The balance will be appropriated by the trustees for the college from undesignated pledges. Oberlin College will take title but the building and equipment will also be used by the town. The hospital will be of hollow tile and stucco construction and will accommodate twenty-eight patients.——The Emergency Tuberculosis Hospital maintained by Stark County for the last two years was closed, July 15. Patients will be sent to other institutions until the county's new sanatorium is erected. ——A new building, to be used exclusively for crippled children, will be erected at Miami Valley Hospital, Dayton, at a cost of about $50,000 and will be known as the Whitmore Memorial Building.——The selection of the site for the new $600,000 Lima City Hospital by the city commission has resulted in an injunction brought by one commissioner, who is said to have the support of the Allen County Medical Society, a committee of which has declared that the site is "wet, foggy, unsanitary, odoriferous and mosquito-breeding." ——The Bethesda Hospital, Zanesville, has just completed a new addition which increases its capacity to 210 beds.

OKLAHOMA

Personal.—Dr. Robert C. Sullivan, Bartlesville, has been appointed health officer for Carter County. He will have charge of a cooperative health unit in Ardmore with branches at Healdton and Wilson.

SOUTH CAROLINA

Annual Public Meeting.—The third annual public meeting of the Pickens County Medical Society was held at Central, July 2, with physicians of the surrounding counties and the public invited. The *Journal of the South Carolina Medical Association* commends this type of program to all other county societies for at least one annual meeting. A well equipped public school building is now available in every section of South Carolina, and may be used to advantage by the county medical society to hold public meetings.

TENNESSEE

Appointments at Vanderbilt.—The board of trustees of Vanderbilt University, Nashville, have made the following appointments to the medical faculty, to take effect in 1925: Dr. Glen E. Cullen, Ph.D., associate professor of research medicine, University of Pennsylvania School of Medicine, to be professor of biologic chemistry; Dr. Ernest W. Goodpasture, director of the Singer Memorial Laboratory, Pittsburgh, to be professor of pathology; Dr. Robert Sidney Cunningham, associate professor of anatomy, Johns Hopkins University Medical Department, Baltimore, to be professor of anatomy; Dr. James M. Mill, assistant, Rockefeller Institute for Medical Research, New York, to be professor of bacteriology. During the present year, Drs. Cullen and Goodpasture will study in Europe, and Dr. Mill in this country, on grants awarded them by the General Education Board, New York, while Dr. Cunningham will continue his work at Johns Hopkins University.

TEXAS

Personal.—Dr. Noah W. Andrews, Canton, for more than a year associate health officer of Dallas, has been elected director of public health to succeed Dr. Lane B. Cooke, Dallas, who has been appointed superintendent of the city-county hospital system.

Freshman Class at University.—The number of freshman medical students to be accepted for admission to the University of Texas Department of Medicine, Galveston, will be limited hereafter to sixty, it is reported. On a recent date, forty applicants for the next school session had been accepted from among ninety applications.

VIRGINIA

Gift for Scholarships.—The University of Virginia Department of Medicine, Charlottesville, has received the sum of $15,000 from an anonymous donor to establish scholarships in memory of Dr. Richard H. Whitehead, dean from 1905-1916.

Personal.—Dr. Harry D. Howe, Newport News, has been appointed consulting surgeon at the National Soldiers' Home, Virginia.——Dr. William M. Smith, Berryville, was elected president of the state board of health at a meeting of the new board, July 29.

WISCONSIN

Gift for Chemotherapy.—The University of Wisconsin has received a gift of $1,000 from Professor and Mrs. Edward Kremers to establish a trust fund in memory of their son for research in chemotherapy. Professor Kremers is professor of pharmaceutical chemistry and director of the pharmaceutical experiment station at the university.

Personal.—Dr. Smiley Blanton, consultant in psychiatry, University of Wisconsin Medical School, Madison, has been appointed head of the department of the child guidance clinic of the University of Minnesota to succeed Dr. Lawson G. Lowrey, who goes to Cleveland.——Dr. John M. Dodd, Ashland, for nine years secretary of the state board of medical examiners, has retired from that position. The office of the board will be moved to La Crosse.

PHILIPPINE ISLANDS

Suspension of Public Health Training School.—The *Revista Filipina de Medicina* states that the board of health, on account of lack of funds, is expecting to close the training school for employees of the public health service. It has

been very useful in the two years it has been established, graduating groups trained in sanitary inspection, etc. Unless appropriations are made soon by the legislature the school will close.

CANADA

Hospital News.—The summer hospital built by the Toronto, Ont., Red Cross Society at Toronto Island, was opened recently by the mayor of Toronto. It will accommodate twenty-five patients, permanent inmates of Christie Street Hospital, Toronto.

University News.—The University of Toronto will hold a special convocation at which the chancellor, Sir William Mulock, will confer honorary degrees on a number of the visiting members of the British Association for the Advancement of Science.

Personals.—Dr. Earl D. MacPhee of the University of Alberta has accepted an appointment to the staff of the department of psychology at the University of Toronto, Toronto, Ont.——James W. Bridges, Ph.D., associate professor of psychology at the University of Toronto, has been appointed as associate professor of abnormal psychology at McGill University, Montreal, Que.——Dr. Lillian Grady, assistant physician at the St. Lawrence State Hospital, Prescott, Ont., for the last three years, has tendered her resignation, effective August 15.

GENERAL

Personal.—Dr. Samuel T. Darling, Baltimore, of the International Health Board of the Rockefeller Foundation, was elected president of the American Society of Tropical Medicine at its recent annual conference in Chicago.

Conference on Pharmaceutical Research.—The third annual meeting of the National Conference on Pharmaceutical Research will be held in Buffalo, August 23. Two sessions, to be attended by delegates from every state, have been planned.

Coming Meetings.—The annual meeting of the New England Surgical Society will be held at Hartford, Conn., September 26-27, under the presidency of Dr. Fred B. Lund, Boston.——The annual meeting of the American Academy of Physiotherapy will be held at the Hotel Pennsylvania, New York, September 8.

International Union Against Tuberculosis. — It was announced by the National Tuberculosis Association, August 7, that the International Union Against Tuberculosis, in annual convention at Lausanne, Switzerland, has selected the United States for its 1926 convention, the city to be selected by the National Tuberculosis Association.

Coal Mine Accidents.—The bureau of mines reports that accidents at coal mines in the United States, in June, resulted in the death of 161 men, which amounted to 4.22 deaths per million tons of coal mined. The rate in June, last year, was 3.73 deaths per million tons mined. The bureau of mines' report covering the first six months of 1924 shows that 1,302 men lost their lives in accidents at coal mines, of which number 1,049 were killed at bituminous mines and 253 at anthracite mines, making a death rate of 4.76 per million tons compared with 3.91 for the similar period last year. A comparison of the causes of accidents in the first half of 1924 with those for the first half of 1923 shows that explosions of gas or coal dust is the only class of accidents with increased fatality rates. There were no fatal accidents in the Alaskan coal mining industry during the first five months of 1924.

Adapting Nutrition Work to a Community.—The New York Association for Improving the Condition of the Poor has issued a report prepared by the superintendent of its nutrition bureau, summarizing the results of a campaign against malnutrition which has been carried on in the Mulberry district of New York City. The report states that of 2,181 apparently well children examined in the medical clinics at Mulberry Health Center, 656, or 30 per cent., were diagnosed as malnourished. During the four and one-half years of work covered in this report, intensive care was given to 1,018 malnutrition cases, and in addition the habits of all the children in the families of these special malnutrition cases were influenced. With an average of 3.8 children per family, 2,578 children received attention. Group work naturally seems more economical of time than intensive home visits, but it was extremely difficult to get these women (mostly Italians) out at stated intervals and much time was lost thereby. The average cost per visit in a home has been estimated to be 37 cents. The average cost per person per lesson where the women were taught in groups was estimated to be 36 cents, with an average attendance of eight per lesson. At practically the same cost and with more satisfactory results from intensive work, in this particular neighborhood the malnourished preschool child was handled more economically through intensive work than in groups.

Meeting of American Chemical Society.—It is expected that more than a thousand delegates from universities and industrial enterprises will gather at Cornell University, Ithaca, N. Y., September 8-13, for the fall meeting of the American Chemical Society. Among others, Sir Robert Robertson, president of the Faraday Society, and Sir Max Muspratt, an industrial chemist, will come from England; and S. P. Sorensen, known for work on the hydrogen ion, from Copenhagen. Sir Robert Robinson, an authority on explosives, will discuss "The Chemistry of Trinitrotoluenes," and Professor Sorensen, "Serum Globulins," at a general meeting in Bailey Hall, September 9, at which Livingston Farrand, president of Cornell University, will preside. There will be an inspection of the Baker Laboratory under the direction of Prof. L. M. Dennis, head of the Cornell Department of Chemistry, and among others a discussion of the nation's fuel supply, in which Prof. S. W. Parr, of the University of Illinois, will lead round-table conferences on "The Storage of Coal and Spontaneous Combustion." There will be a symposium on "Industrial Wastes and Their Relation to Potable Water Supplies," and the division of industrial and engineering chemistry will hold a two-day symposium on "Absorption." On the evening of September 10, Dr. Leo Hendrik Baekeland, New York, president of the American Chemical Society, will deliver the presidential address in Bailey Hall. Trips of inspection to points of industrial and scenic interest in upstate New York will close the program.

LATIN AMERICA

Typhoid Vaccination Compulsory in Cuba.—A presidential decree made public, August 2, makes vaccination against typhoid fever compulsory for every person in Cuba, it is reported. Although there has been a decrease in the epidemic of typhoid in Cuba, official figures show that on August 2 there were still 279 cases in Havana alone.

Personal.—A banquet was recently tendered Dr. Renato Machado, professor of ear, nose and throat diseases at Bello Horizonte, on his removal to Rio de Janeiro. He had charge of a similar department in the Brazilian hospital at Paris during the war, and has long been on the editorial staff of the *Brazil-Medico*.——Among the interchange professors now lecturing in South America are Professor Brumpt of Paris, giving a course on parasitology at Rio de Janeiro, and Prof. J. Casares Gil of Madrid, lecturing at Buenos Aires on physical chemistry and laboratory technic.——A physician, Dr. Bernardo Gastélum, a gynecologist of Culiacan, Sinaloa, formerly minister to Argentina from Mexico, has been appointed chief of the department of public instruction in Mexico.

FOREIGN

Germany Prohibits Importation of Arsenical.—The *Deutsche medizinische Wochenschrift* notes that the customs authorities in Germany have prohibited the importation of a French arsphenamin which the manufacturers claim is effectual by mouth in treatment of syphilis.

Women Physicians in Japan.—The *Japan Medical World* states that at present there are about 1,200 women in Japan who have qualified as physicians and that the Tokyo Medical College for Girls, established in 1889, admits about 130 students each year. Until thirty years ago there were no women physicians in Japan.

Municipal Training School for Nurses.—The *Wiener klinische Wochenschrift* states that the community of Vienna has organized a training school for nurses at the Lainz Hospital. There will be accommodations for thirty pupils for a three year course, and for sixty for a one year course for post-graduate study. The school is expected to be ready October 1.

Conference on Malaria.—Eleven nations were represented at the recent international conference on malaria held at Moscow, in July, besides the malaria commission of the League of Nations. Professor Nocht of Hamburg presided, and trips were made through the malarial zones of the Balkan states and southeastern Europe. There is to be a second reunion at Rome next month to correlate the data collected.

The Mission Exposition.—An important place is to be given to the medical aspect of missions in the exhibition now being

planned at the Vatican. The diseases of the countries where missions are maintained, mode of transmission, means of defense and of treatment are to be represented, and the importance of medicine as an aid in mission work. The committee in charge of the medical section includes Professors Havet of Louvain, Franchini of Bologna, Dürck of Munich, Totsuka of Tokyo and a British and an American professor yet to be appointed, with a representative of the Pasteur Institute of Paris.

The Next International Congress on Military Medicine and Pharmacy.—The first congress of this kind was held at Brussels in 1921 and the second at Rome in 1923. The date for the third gathering of the kind is now announced for April 25, 1925, to convene at Paris, with Professor Vincent, the medical inspector general of the army, as president. A large committee of organization is already at work, including, besides the army and navy medical authorities, Professor Hartmann, president of the association to promote medical relations between the allied and friendly nations, and the secretaries of the surgical and urologic societies.

Personal.—The *Medicina Ibera* mentions the arrival at Madrid of a party of physicians and students from North America.——Dr. Enderlen, professor of surgery at Heidelberg, has been elected honorary member of the Swiss Surgical Society.——In honor of Prof. G. Romiti, on completion of his fiftieth year as professor of anatomy at Pisa, a fund has been collected for the benefit of war orphans.——A gold medal was presented, recently, to Prof. G. G. Perrando on the occasion of the twenty-fifth anniversary of his incumbency of the chair of forensic medicine at Genoa.——Prof. L. Lucatello, professor of clinical medicine and rector of the University of Padua, has been appointed to succeed Maragliano at the University of Genoa.

Midwives and Jury Service.—The home secretary, England, has notified the undersheriffs that the question of legislation to secure general exemption from jury service of all midwives, in virtue of their calling, will be considered when a suitable opportunity presents itself. He suggests that when undersheriffs are satisfied that a certified midwife has given notice to a local supervising authority of her intention to practice, a mark should be placed against her name in the jury book, to prevent a summons being sent to her. By the Jury's Act of 1870, peers, members of parliament, judges, clergymen, various persons engaged in the practice of law, medical practitioners, pharmaceutical chemists and various others are exempted from jury service.

Narcotics Required in China.—The International Anti-Opium Association obtained statistics of the amount of opium and cocain used for medical purposes by 100 of the largest mission hospitals in China, whose attendance amounted to 850,000 patients in a year. It was found that 225 grains (14.6 gm.) of "narcotics" and 45 grains (2.9 gm.) of cocain per thousand patients were used. The *China Medical Journal* says that the year 1923 has been the worst since 1917 during the period of opium recrudescence, and that every province in China but one, Shansi, not only had unrestrained opium cultivation and use, but in many provinces the cultivation of opium was compulsory under heavy taxation and the traffic was encouraged in every way.

Medical Women's International Association.—At the third conference of this association, London, July 14, under the presidency of Dr. Esther Lovejoy, New York, about 300 members registered, including seventy-five representatives of countries overseas, among whom were women from Constantinople, Australia and Uruguay. The general meeting was largely devoted to business, as this was the first meeting of the fully constituted representative council under the amended constitution. At a preliminary meeting in New York, in 1919, it was decided to form a worldwide association of medical women; the constitution was discussed at the second meeting in Geneva, in 1922, and at the present meeting the necessary by-laws were added. At the scientific session, July 17, among others, Lady Barrett, the president-elect, read a paper on "Maternal Morbidity." The conference opened with a reception at the Royal Society of Medicine, July 14.

The Lancet Luncheon.—A luncheon was given by *The Lancet* at the Hotel Victoria, London, July 17, to overseas medical representatives who were visiting England in connection with the British Empire Exhibition. About sixty guests accepted the invitation. Sir Ernest Hodder-Williams, chairman of *The Lancet*, presided. Sir Squire Sprigge, the editor, pointed out that in a copy of *The Lancet* of a little more than 100 years ago he found the first foreign communication, the appearance of which was considered by the editorial staff of that day a great event. Now, he said, the publication of foreign correspondence from almost every part of the globe was a weekly incident, but that this could not be done if it were not for the extraordinary good will of the people at the peripheral centers towards those at the old center; only by that kind of cooperation could such papers as THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, *British Medical Journal* or *The Lancet* be produced.

Epidemic Poliomyelitis in Switzerland.—The *Schweizerische medizinische Wochenschrift* gives the official statistics on epidemic poliomyelitis in Switzerland in 1923. A total of 257 cases were reported, over twice as many as ever known before in the country. In Lucerne the disease assumed a malignant character, and the public health service summoned a conference of physicians who had had to deal with such cases. Stoos emphasized that previously the disease had never assumed an epidemic form, the small groups not spreading, and only small children being affected. In the Lucerne and Sattel epidemics last year, older children and adults contracted the disease in house and family epidemics, and it assumed a graver, cerebral form. Stirnima and Döpfner presented evidence incriminating *Stomoxys calcitrans* in the transmission of the disease. Several speakers stated that the official figures were far too small. It was decided to publish a circular for the public and one for physicians, advocating isolation for four weeks; keeping child contacts under 12 out of school for four weeks, and closing of classes, crèches, etc., for two weeks after a case has developed in the institution.

Annual Meeting of British Medical Association.—At the ninety-second annual meeting of this association at Bradford, July 18, the president-elect, J. Basil Hall, introduced the lord mayor of Bradford, the town clerk and an alderman, who were present to welcome the association on its first visit to Bradford. After some formal business, Lieutenant-Colonel O'Kinealy was elected to represent the Indian Medical Service on the British Medical Association Council, 1924-1927. Dr. G. E. Haslip, retiring as treasurer on account of ill health, was elected a vice president, and Mr. N. Bishop Harman was elected treasurer. Dr. F. G. Thomson of Bath was elected president of the association for 1925-1926, and the next annual meeting place was fixed at Nottingham. The acting treasurer, Dr. R. A. Bolan, gave an account of the association's new home which it is proposed to enter in March, 1925, without ceremony, the formal opening to take place a few days before the annual meeting later in the year. Dr. S. Morton Mackenzie, chairman of the organization committee, said that the total membership of the association to date was 27,533, the highest number yet recorded. Nearly 2,800 new members joined last year, attracted, he thought, by the willingness of the association to take up anything to help its members. Dr. H. B. Brackenbury was elected chairman of the representative body. Twelve members of the council were elected by grouped representatives and four by the representative body from among its members for nomination as direct representatives to the General Medical Council.

Deaths in Other Countries

Dr. **Edoardo Bassini,** senator and emeritus professor of surgery at the University of Padua, aged 80. He was a frequent contributor to the progress of surgery, and his name is connected with the operation for hernia which introduced a new principle of reconstruction.——Dr. **G. Geley,** director of the International Institute for Metapsychics at Warsaw, and of the *Revue de metapsychique*, was killed in the fall of an aeroplane.——Dr. **Debecker** of Brussels, administrator of the medical life insurance society La Médicale.——Dr. **D. Ramos** at Rio de Janeiro, formerly director of the medical faculty at Bahia and of the local public health service.——Dr. **J. Pondé,** professor of ophthalmology at Bahia.——Dr. **M. H. Alcívar,** rector of the University of Guayaquil, professor of surgery and former president and one of the founders of the Sociedad Médico-Quirúrgica, aged 56. The entire issue of the July *Anales* is devoted to the addresses and tributes to his memory at home and abroad.——Dr. **E. Meissen,** director of a sanatorium for the tuberculous in Germany, aged 70.——Dr. **K. Hübecher,** professor of orthopedics at Basel.——Dr. **I. Larrain,** one of the oldest physicians of Buenos Aires.——**Dr. Muntendam Not Dead.**—THE JOURNAL, August 2, p. 368, announced, through error, the death of Dr. P. Muntendam, assistant editor of the *Nederlandsch Tijdschrift voor Geneeskunde*. Tributes were being paid to him for a quarter century of work on the *Tijdschrift*, not obituary tributes, and it seems his "disappearance" was only to avoid the public tribute.

Government Services

Field Work at Carlisle Barracks

Carlisle Barracks, Pa., the home of the Medical Field Service School, and the First Medical Regiment, is the largest medical training center of the army. It has a permanent personnel of twenty-three officers and 475 enlisted men of the medical department. Lieut. Col. Charles R. Reynolds, M. C., is commandant. The functions of this station include training young officers of the medical department of the regular army, and medical, dental and veterinary officers of the National Guard and the Reserve Corps. It conducts annually the large medical reserve officers' training camp, the students coming from practically all the large colleges located east of the Mississippi. Carlisle provides the chief element of training for field service in furthering preparedness plans of the Surgeon General. The latest methods of collecting, transporting and hospitalizing the sick and wounded under simulated battle conditions receive the most careful consideration and study. Carlisle in the last few weeks has been the site of the largest medical training camp held since the World War, the regular garrison having been augmented by more than 400 medical department R. O. T. C. students, 300 reserve corps officers of the medical department, and about 300 officers and enlisted men comprising the One Hundred and Fourth Medical Regiment of the Maryland and Virginia National Guard, all encamped on the grounds at Carlisle. The Surgen General, with members of his staff, witnessed a maneuver in which approximately 1,200 individuals of the medical department participated on a line of about 6 miles. Battalion and regimental aid stations, collecting stations, ambulance stations, and hospital station were manned by members of the student body comprising the R. O. T. C camp, aided by the One Hundred and Fourth Medical Regiment of the National Guard. The reserve officers in camp were conducted over the entire route of evacuation, and at each "station" were given a brief talk by the officer in charge. This maneuver, with two medical regiments participating, embraced the largest number of medical department personnel ever assembled at one time during peace.

Among the medical reserve officers in camp were: Deans Pepper, Patterson, Huggins, Begg, McElroy and Lye. Brig.-Gen. Joel E. Goldthwait, M. O. R. C., Harvard University, gave a lecture on "Benefits to Be Derived from Military Training."

Through a loud speaking device, General Ireland addressed the entire group of trainees, outlining the preparedness plans of the Surgeon General, and stressing the relations that should exist between civil practitioners and regular army officers of the medical department. He stated that this was the first time he had had the pleasure of addressing in one assembly members of the regular army, the National Guard, the Reserve Corps, and the students of the R. O. T. C. units. Following his address, General Ireland witnessed a review of the entire command. Several thousand visitors from neighboring cities of Pennsylvania and adjacent states attended.

Executive Committee of Veterans' Bureau Council

The Council of Medical and Hospital Affairs appointed by the director of the Veterans' Bureau from medical authorities throughout the United States, in session at Washington, D. C., July 22-24, was called for the purpose of acting in an advisory capacity on problems that arise in caring for 23,000 patients hospitalized by the bureau. The council divided itself into four divisions, neuropsychiatric, tuberculosis, general medicine and surgery, and hospitalization, the last two acting as one division. Dr. Daniel J. McCarthy, Philadelphia, was selected chairman of the neuropsychiatric division, and Dr. George M. Kline, Boston, secretary. Dr. Roy D. Adams, Washington, D. C., and Dr. Harry A. Pattison, New York, were made chairman and secretary, respectively, of the tuberculosis section, while Col. R. U. Patterson, M.D., Washington, D. C., and Dr. Louis I. Dublin, New York, were made chairman and secretary, respectively, of the two last divisions. The chairman of the standing committees with the officers of the council form the executive committee, which will function as a permanent organization. Officers of each division will be permanent officers and will function as such between conferences.

Foreign Letters

LONDON

(From Our Regular Correspondent)

July 25, 1924.

Annual Meeting of the British Medical Association

The ninety-second annual meeting of the British Medical Association was held at Bradford, an important Yorkshire town and center of the woollen industry. About 1,000 members attended. At the representative meeting some subjects of great importance were discussed, such as the protection of physicians from litigation as the result of certification. A resolution was moved that the provision of a certificate under the lunacy acts by a physician should have the legal testimony status of testimony given in a court of law, and should not render the physician liable either to any civil action or to any criminal charge, except so far as the certificate may be shown to contain statements of essential importance, which are proved to be inaccurate and to have been made with intention to deceive. It was pointed out that the responsibility of certifying was accepted by the profession largely in the public interest, and was heavy and obnoxious. As the law was, the profession alone stood between the community and the person of unsound mind, and by it alone was that person protected against himself. Though there was no legal compulsion on the physician to sign a certificate of insanity, the moral pressure was such that he had to do so. The law recognized that the certification was a public service, by providing some protection. Thus, no action against the physician could succeed if the physician was able to show that he had acted "in good faith and with reasonable care." But this did not entirely prevent the physician from being harassed by actions. The resolution proposed to make the protection complete. The resolution was carried unanimously.

MEDICAL DEFENSE

A resolution was presented that, in view of the increasing need for legal defense, the association should undertake the work. It was pointed out that less than 50 per cent. of physicians were members of the three medical defense societies. The commercial insurance companies were entering the field and offering, for a premium of $5, an unlimited guarantee against liability. Presumably they had some actuarial calculation by which they concluded that they could make a profit. Why, therefore, should the association not undertake the work? In opposition, it was pointed out that the existing defense societies were doing their work well; that a division of the association was an unsuitable place to deal with difficult claims, because local prejudices would be introduced; unwelcome advice had often to be given by the defense societies; furthermore, if it was known that the association was defending actions against its members, heavier penalties would be inflicted than against individual physicians; finally, the financial responsibility undertaken would be great. The motion was lost.

ORGANIZATION OF THE ASSOCIATION

It was announced that the total membership to date was 27,533, the highest number yet recorded. Last year, nearly 2,800 new members joined, attracted by the proved willingness of the association to take up anything to help its members. The handbook for recently qualified medical practitioners was proving useful in recruiting, and was being distributed gratis to those attending the social meetings of welcome at teaching centers. At Newcastle-on-Tyne, during the last two years, every newly qualified physician had joined. Prizes for essays on clinical or pathologic subjects were being offered to final-year students. In South Africa, although a referendum of

the whole profession had shown a majority of 190 out of 1,288 voting in favor of the formation of an affiliated South African medical association, a second referendum of members of the South African branches of the association resulted in seven out of the ten branches (with a total membership of 700) voting against the formation of a new association. A motion was introduced disapproving of the Council's suggestion to dispense with approving signatures on forms of application for membership, and affirming that such signatures are a safeguard against the division or branch being exploited by individuals unworthy of becoming members. In the discussion, it was contended that an approving signature had not kept out undesirable members. The meeting rejected the resolution on the assurance that every divisional secretary should be an ex officio member of the branch council which admits applicants. It was proposed that of the eight members of the British Medical Association council elected by the representative body, at least one shall be a woman. A woman member of the council stated, on behalf of the women members of the association, that they recognized that the association was a democracy with no sex bar, and that they preferred to stand without privilege. There were, in fact, three women present as representatives of divisions or branches. The resolution was withdrawn.

PAYMENT OF PHYSICIANS FOR SERVICES IN VOLUNTARY HOSPITALS

A resolution was introduced that "where the board of a voluntary hospital receives contributions from individuals in return for or in anticipation of treatment, the members of the visiting medical staffs should receive recognition of their services, either in the form of an agreed honorarium or by means of a percentage of all such payments being passed into a special fund. Such honorarium or fund can be allocated in any manner which the visiting medical staff may determine." After a long discussion, this resolution was carried.

THE BRITISH MEDICAL ASSOCIATION AND THE CANADIAN ASSOCIATION

The delegates who recently visited Canada to discuss affiliation with the Canadian Medical Association presented their report, which was received with acclamation. A resolution was carried unanimously: "That the representative body has heard with extreme gratification the report of the delegates on the cordial welcome given by the Canadian Medical Association to the proposals for affiliation, and empowers the council to carry these proposals into effect."

THE PRESIDENTIAL ADDRESS

Mr. J. Basil Hall, honorary consulting surgeon to the Bradford Infirmary, delivered an eloquent presidential address containing important admonitions on present-day tendencies. He did not think that recent military experiences had done much to advance professional usefulness in dealing with sickness in civil life. The whole war period brought into focus an exaggerated idea of the importance of surgical technic, and cramped the development of surgical judgment. The treatment of every injury and every disease became standardized. It was a bad training for the newly qualified student of medicine; each became a mere cogwheel in a great machine designed to fulfil a special purpose. During the most impressionable period of their career, they worked in the midst of all the sensational excitement associated with military service, and civil practice was now an irksome task for them. Hence was largely derived the widespread desire to practice some form of specialism, which had become an idol. To the layman the term "specialist" had become a cabalistic word which he repeated on every possible occasion. There was, however, one specialism which he frequently failed to appreciate at its proper value—the specialism of general practice. It required more knowledge of human nature and more experience over a wide field of observation to make a first-class general practitioner than the public had any cognizance of. Clinical observation threatened to become a lost art, and radiography and all the modern scientific methods were good servants, but bad masters. Their present failing was an overconfidence in modern technic and a lack of the appreciation of the value of that wisdom which could be obtained only by personal observation and experience. He urged those of the younger generation to think more and observe more for themselves, as their forefathers did, and not be so ready to bow the knee in a fanatical worship of so-called scientific methods of investigation. Experience begotten by patient observation would teach them the real value of scientific methods, and their limitations.

TISSUE CULTURE AND PATHOLOGIC PROBLEMS

Dr. Alexis Carrel of the Rockefeller Institute, New York, reported that the method of tissue culture, although still in its infancy, was already a powerful instrument for the investigation of the relations of the tissues and the humors. Tissues grew not in accordance with inherited energy, but in accordance with the growth-favoring or growth-retarding elements in their environment. As long as the proper amount of food material was given to connective and epithelial tissues, and their waste products were removed, growth went on. Thus, some tissues could be "considered as potentially immortal." He had a strain of fibroblasts, which he obtained more than twelve years ago, fully as active today as at the end of the first year. The important discovery that blood serum actually retards growth had been made by using the method of tissue culture. Serum contained two antagonistic principles—growth-restraining and growth-promoting substances. The growth-promoting ones were always weaker than the growth-restraining; hence the depressing action on tissue growth of the serum. This growth-restraining power of serum varied, too, with the age of the animal, being least in early youth. In old age, growth-promoting power was gradually lost. While the blood serum retards growth, certain of the white blood corpuscles stimulate it by enabling the cells of the body to nourish themselves, and so become larger. These corpuscles, the lymphocytes, may be looked on as tiny, free-moving glands, which bring to the fixed or nonmoving cells the principles necessary to their growth. Such principles are abundantly present in the bodies of growing embryos, and are spoken of as trephones. In adult life, they seem to be stored in the white corpuscles, which can release them as occasion demands; e. g., when growth is required to heal and fill up a wound, or when a broken bone has to be "joined" again. Thus, the white corpuscles of the blood have a double function: to defend the body against bacteria (as "warrior cells") and to promote growth where it is necessary for the purpose of repair. The stimulus to pathologic growth might consist of trephones—growth-promoting substances—coming from the leukocytes, or set free by dead muscle or gland cells, which was foreseen by Welch many years ago. That idea explained the mechanism of wound healing. It was known that a perfectly clean wound, a wound free from débris of tissue and blood clots, and absolutely protected from outside irritation, did not heal. But if some irritation—for example, dry gauze or turpentine or the presence of a few bacteria—were at work, the wound healed. Irritation, even mild irritation, brought white blood corpuscles to the seat of the wound, and these supplied the necessary growth-promoting substances.

THE IMPORTANCE OF MINERAL ELEMENTS IN DIET

Dr. John Boyd Orr, director of the Rowett Research Institute, Aberdeen, pointed out that during the last few years there had been a tendency to regard the evil effects of too exclusive a use of certain refined foodstuffs as due chiefly or

entirely to a deficiency of vitamins. Recent work, however, had shown that many of the evil effects might be attributed to a lack of correspondence between the mineral content of the diet and the mineral requirement of the body. Of the fifteen chemical elements making up the body, ten were mineral elements, and each of these was known to perform functions that could not be adequately performed by any of the others. All these minerals were continually being lost from the body in the excretions, and all were required as the constructive material of growth. The dietary of a large part of the populations in this country, especially in the cities, consists mainly of cereal products and other carbohydrate-rich foodstuffs, such as potatoes and farinaceous foods, because they are the cheapest sources of energy. The most common supplements are meat and butter or margarin. The average per capita consumption of milk is only about half a pint daily, and in many households green vegetables do not form a regular part of the diet. Hence the foods that form the greater part of the diet are those deficient in both calcium and iron. It has been estimated that 50 per cent. of American dietaries contain less than 0.67 per cent. of calcium, which is well below the standard of 1 gm. a day. In England, the average intake is likely to be even lower, because the average consumption of milk, usually the chief source of calcium in the diet, is twice as high in America as it is in Britain. Fortunately, mineral deficiencies can be easily corrected by food, the virtues of which are universally recognized. Milk, green vegetables and certain fruits are rich in calcium; milk, egg yolk and cereals containing sufficient of the embryo and outer part of the grain are rich in phosphorus. Green vegetables and egg yolk are rich in iron. The only sources of iodin are green vegetables and cod liver oil. Fruits and vegetables have an excess of alkali, and can thus correct a diet that is too acid. On account of its great wealth of calcium and iron, spinach should be of especial value for infants. These foodstuffs, which are rich in inorganic constituents, liable to be deficient in the modern diet, are also rich in vitamins. Much of the beneficial effect is ascribed to hypothetic vitamins. As the mineral matter of the ration becomes more closely adjusted to the requirements of the body, the need for vitamins decreases. Therefore, the adjustment of the mineral balance is of more importance than the inclusion in the diet of substances supposed to be rich in vitamins. Indeed, experiments with pigs, calves and fowls have shown that if the diet is properly balanced with regard to minerals, there is no likelihood of any deficiency of vitamins occurring.

Defective Feeding in Psychopathic Hospitals

The departmental committee appointed to inquire into the diets of patients in psychopathic hospitals has issued its report. It recommends that there should be more uniformity in the construction of the dietary scales, especially with regard to the character of the food, its total amount, the amount of certain staple articles and the avoidance of monotony. It is further recommended that to insure the presence in dietaries of necessary accessory food factors (vitamins) there should be a partial reinstatement of butter as a regular article of diet, a supply of milk in greater quantity, an increased provision of green and other fresh vegetables, a more common use of eggs, a free administration of salads and fresh fruit, and a more general use of whole flour and germ bread. Under proper conditions, the cost of this dietary at present prices should not exceed 17 cents per capita daily for county psychopathic hospitals and 17.5 cents for borough psychopathic hospitals. The committee thinks that insufficient attention is now paid to palatability and attractiveness of food, especially in the matter of variety. Some of the diets examined were inadequate, some excessive. There was an increase of tuberculosis among males in the twelve institutions providing dietaries of the lowest arithmetical values.

PARIS

(From Our Regular Correspondent)

July 18, 1924.

The Centenary of Paul Broca

The Société d'anthropologie of Paris has just celebrated the centenary of the birth of its founder, Prof. Paul Broca. Dr. Dubreuil-Chambardel, professor of anatomy at the Ecole de médecine of Tours and vice president of the Société d'anthropologie, presided at the ceremonies. Dr. Manouvrier, now professor at the Ecole d'anthropologie and who was the preparator of Broca during the last years of his life, sketched the scientific career of Broca, who was not only an eminent surgeon but also a skilful instructor and an enlivening lecturer in anthropology. He it was who, before he had reached the age of 40, founded the Société d'anthropologie of Paris, which was destined to become a model for anthropological societies in other countries. Later, Broca founded the Ecole d'anthropologie and the *Archives d'anthropologie*. He was an indefatigable worker and is the author of numerous works; notably, on the morphology of the brain. The part that he played in the investigation of motor or ataxic aphasia is well known. He ascribed the defect to a lesion at the base of the third left frontal convolution, which has since been named Broca's convolution.

Vocational Guidance in Schools

Drs. R. Laufer and G. Paul Boncour recently presented before the Académie des sciences morales et politiques an interesting communication on the subject of vocational guidance in schools. From the researches that they have carried out with many groups of pupils, comprising several hundred in all, to determine to what extent their aptitudes corresponded to the trades and occupations they desired to enter, three definite conclusions were reached: (1) A large number of remediable affections change the physical and mental qualifications of the pupils; (2) the elements of character and morals are likewise associated with aptitudes that are subject to morbid influences; 66 per cent. of the pupils presenting pathologic states are affected also by weaknesses of character, which should, therefore, be studied with as much care as the physical aptitudes; (3) only from 10 to 15 per cent. of the children were really adapted to the occupations that they had chosen. Six per cent. were found to have tuberculous defects.

Mental Pathology in Modern Literature; More Especially, the Novel

Mental pathology seems to be quite à la mode in literature, and the theories of Freud have become for writers of the drama and the novel a mine, which they have exploited almost ferociously. As a rule, the authors of these works unfortunately display great ignorance in medical matters. It is quite a different thing when a work of fiction is written by a physician, as is the case with Notre-Dame de la Sagesse, a novel by Pierre Dominique. As previously mentioned, this is the pen name of Dr. Pierre Lucchini. The principal personage of his novel, Thibaut, is a young intellectual who is subject to a mystical delirium with a paranoiac basis. After studying and securing the degree of licentiate in belles-lettres, the young man divides his fortune among members of the humble class and becomes an ordinary ditch digger. His family then intervenes and has him put in the asylum at Villejuif. He plays the part of a victim of persecution, and his revolutionary and generous ideas, joined with his facility of speech characteristic of those suffering from ideas of grandeur, secure for him adherents even in the asylum. But the greatest adept is Margot, a girl who has a wretched and pitiable childhood back of her. Her weak and half cultivated mind is attracted by the anarchistic theories of Thibaut, and she helps him to make his escape from the asylum. Thibaut finds his writings

universally admired and is regarded as a great man. There is a subtle irony in the divergence between the portraits of Thibaut as seen by physicians and as viewed by the eyes of laymen.

Illegal Practice of Medicine

In previous letters, I have mentioned the indulgence shown by French courts on many occasions toward all kinds of illegal practitioners. Recently, it is true, the court of Compiègne sentenced one, "Father Bar," to pay a fine of 500 francs. But, in another case of the same kind, in which a "Father Benoist" figured, the court of Amiens limited itself to a fine of 1 franc, but suspended the sentence. Worse than that, the indulgence of the court of Amiens was manifested in a series of "extenuating circumstances": Benoist is guilty, it is true, of the illegal practice of medicine, but, though he is 66 years old, he has never had a sentence imposed on him; he is universally respected in the community; he has never enriched himself by the application of his methods; his purpose was mainly philanthropic! These extenuating circumstances were, of course, published in the daily press, which also did not fail to express its sympathy for him. One well known journalist, Clément Vautel, in discussing the subject, stated: "The healers who treat their patients with herbs, magnetic passes or diabolic incantations are, on the whole, less of a menace to public health than certain specialists with an array of diplomas who put up their misleading, charlatanic posters in the comfort stations." In reply, Dr. G. Duchesne, secretary of the editorial staff of the *Concours médical*, calls attention to the fact that the comfort stations no longer contain such posters but that, on that account, the last page of large dailies fairly bristles with the advertisements of such charlatans. Dr. Duchesne reproduces a column of such advertisements taken from the same number of the journal in which appeared the article of Clément Vautel. Herein, sufferers from syphilis and gonorrhea are promised marvelous cures. Distance is no obstacle: "If you live too far away, write, giving details of your condition, to the chief physician, who will prescribe for you, free of charge, in a plain envelop, the energetic treatment needed in your case." "It would appear, therefore," says Duchesne, "that the front page of the journal has a dignified, moral tone, while the last pages give space to the immoral publicity that is stigmatized on the first page. If we are going to clean house, the place to begin is the press."

Shackles that Hinder the Expansion of Scientific Journals

In official circles, it is a common thing to recommend to scientific societies to send their bulletins and reports of proceedings to foreign countries, to solicit exchanges with similar societies in other countries, and to be generous in the distribution of documents without even demanding similar courtesies in return—all with the view of extending the knowledge of French science abroad. But, quite recently, a decree of the postoffice department has increased by 33 per cent. the rate of postage on journals going to foreign countries. A journal weighing 65 gm., which could be sent for 5 centimes, before the war, costs today 30 centimes postage. By multiplying this rate by the total subscription, it will be readily seen that this increase means, in the aggregate, a heavy additional load for publishers. The *Gazette hebdomadaire des sciences médicales de Bordeaux* complains bitterly of the new postal rate, introduced in the middle of the year, at a time when the subscription price can no longer be changed. It appears evident that a number of scientific journals will, in the nature of the case, be compelled to reduce their free exchanges with foreign countries. The daily papers, the *Gazette* remarks, will not suffer especially from the increased tariff. They will soon make up their losses with the sums paid them for the advertisements of special institutes where, in a few hours, all blood taints may be cured by vegetable and other products. If it is necessary to find other sources of income, would it not be more rational to impose a formidable tax on medical advertisements and posters of the aforementioned type, which are diametrically opposed to the scientific, hygienic and moral interests of the country?

Death of Dr. Adolphe Jalaguier

Dr. Jean Adolphe Prosper Jalaguier, formerly agrégé professor at the Faculty of Medicine of Paris and honorary surgeon to the hospitals, has died at Poupel, near Montauban, at the age of 71. Jalaguier was born at Montauban, March 24, 1853. He entered the University of Paris for his medical training, and was graduated in medicine in 1880, becoming a surgeon to the hospitals in 1884. Two years later, he was appointed agrégé professor. When the chair of clinic of surgical diseases of children was created, on which he had some claim, many professors thought he was the logical choice for the post. But the mere perspective of the official duties that he would be required to assume seems to have appalled him, so that he yielded his claims to Kirmisson. He was an excellent clinician and a skilful operator. He specialized in pediatric surgery, which he enriched by his own technic; for example, his procedures for the cure of harelip, congenital and paralytic clubfoot, coxalgia, etc. According to Prof. J. L. Faure, he was one of the first to see clearly into the problem of appendicitis, and, along with Walter, he revealed the frequency of chronic appendicitis without critical attacks and sometimes even without pain. He established the modes of intervention in a paper presented in 1900 before the International Congress of Medical Sciences. He was the first surgeon in France to operate with gloves. He was unanimously elected president of the Société de chirurgie, and, since 1912, he had been a member of the Academy of Medicine. During the war, he had charge of the surgical service for officers in the Military Hospital of Val-de-Grâce.

The League of Nations and the Campaign Against Malaria

Malaria is at present prevalent in many countries of Europe. In Russia, endemic malaria has spread, in recent months, to an alarming extent. There are foci of malaria along the Baltic, in Poland, Sweden and Germany; they are found also in Holland, along the borders of the Scheldt; likewise in Ireland. Malaria has become entrenched along the European coast of the Mediterranean, the eastern coast of Spain, Corsica, the shores of Italy, Sicily, Greece, and Turkey in Europe. Central Europe has been invaded; likewise, Austria throughout the valley of the lower Danube and its tributaries—Dalmatia, Herzegovina, Bosnia, southern Russia, and the Balkan states. In France, to be sure, malaria has almost disappeared, but the war has shown that it is possible for it to spring up again under exceptional conditions.

In view of this state of affairs and of the possibility of bringing about an effective prophylaxis, the Health Committee of the League of Nations has appointed a commission for a threefold task: (1) to collect information concerning the malaria situation throughout the world and particularly in Europe; (2) according to collected information, to compare the prophylactic methods employed in various countries, with a view to discovering which methods give the best results; (3) to prepare replies to the questions on this subject which may be addressed to the Health Committee. In order to secure as reliable information as possible on malaria, this commission, on which France is represented by Dr. Léon Bernard, professor at the Faculty of Medicine of Paris, and Dr. Marchoux, professor at the Pasteur Institute, has prepared a list of questions which will be sent to the competent authorities in the different countries, together with a circular letter explaining the purpose in view, and urging that in every

country a qualified expert be appointed charged with collecting the information required. It will also be stated that the Health Committee of the League of Nations will place a specialist at the disposal of any country that cannot supply one. The questions bear, on the one hand, on epidemiologic information concerning the malaria situation, including morbidity, mortality, malarigenic factors, social factors, *Anopheles* and the evolution of endemic malaria; and, on the other hand, on information concerning the prophylaxis of malaria: organization of the antimalarial campaign, prophylaxis through quinin administration, therapeutics, etc. This questionnaire will be prepared by expert malariologists, and, in addition to detailed questions, will outline model methods of prophylaxis, so that the mere sending of it has marked instructional value. The commission is in hopes that the replies from the various countries will furnish abundant and accurate information. If incomplete returns are sent in by certain countries, this fact will be interpreted as an indication why malaria is spreading. It is probable that when the statistical tables are published and contain blank columns showing the insufficient character of the replies from certain countries, a sense of pride will induce these to make up their deficiencies. The conclusions drawn by the commission from the information received will make it possible to plan a general program of prophylaxis. Furthermore, once it has this information in hand, the commission will be in a position to offer useful suggestions whereby prophylactic arrangements in a given state may be improved. The commission will not limit its activities to this task. It plans also to send experts into the field to institute an inquiry on the ground, on the subject of the disappearance or the diminution of malaria in some sections in spite of the persistence of *Anopheles*.

VIENNA

(From Our Regular Correspondent)

July 12, 1924.

Opening of the New University Building at Innsbruck

The new university building, which had been commenced in 1914, but which could not be completed during the war, was opened with great solemnity, June 28. The new building succeeds the old one, which dates back to the sixteenth century, and which was antiquated. The hygienic arrangements, and the accommodations for laboratory work and for other research were sorely behind the requirements of our time. There are accommodations for administration as well as for all studies except the purely medical. The latter have to be pursued at the bedside in the old clinical hospitals. The costs of the new building were defrayed by the state, only a small percentage of the actual expenditure being contributed by the municipal and county authorities.

Statistics of Austrian Medical Students

According to official reports for 1923, the following numbers of medical students had been matriculated in the Austrian universities in the winter term 1923-1924: in Vienna, 2,943, of whom 623, or 21 per cent., were in their first semester; in Graz, 1,105, with ninety-nine "first-year" students (9 per cent.); Innsbruck, 422, with forty-six (10 per cent.). We have only these three medical universities, with a total of 4,470 students (768, or 17 per cent. of these being in their first year) for a population of six and one-half millions. This compares with 12,500 students in the twenty-four universities in Germany, with only 530 first year students (or 4.25 per cent.) out of a population of 60,000,000. Vienna alone has more medical students than Berlin and Munich together, and more first-year students than all Germany put together. This remarkable feature is explained by the fact that students from the Balkans and eastern Europe taking up medicine flock to Vienna. In fact, if we consider Austrian citizenship among all the students of medicine in Vienna, we find that only 42 per cent. of them are Austrian born, and only 28 per cent. of those in the first year. This relative overcrowding in our medical institutions has been responsible for the cry of "numerus clausus" so often raised by men imbued with a certain racial or national prejudice, but which heretofore it was always possible to counteract.

Exhibits of Insects of Medical Interest

The zoological department of the Vienna museum of natural history opened recently a collection of insects and their relatives having a bearing on medicine. The whole exhibit is divided into six groups and shows which of these organisms exerts a disease-producing action on human beings or animals (1) by means of the secretions of its glands; (2) by means of hairs; (3) by poisonous appendages; (4) by sucking the blood; (5) by parasitism, or (6) by transmitting disease germs. The entire life cycle of these organisms, as far as it is known, is shown in a series of specimens arranged so as to reproduce the natural conditions, and short but concise explanations are placed in each receptacle. The organisms that are too small to be well visible with the naked eye are represented in colored photographic enlargements. Once a week, expert guidance is provided. The entire collection comprises about 6,000 specimens.

The Problems of Modern Welfare Care for Infants and Children

In a paper read before the Ethical Society, Professor Tandler recently discussed the problems opened up by the modern views of the bringing up of children, chiefly of the poorer classes of the population. He pointed out that out of 100 offspring of the proletarian families, only forty-nine reach the sixteenth year; while in the wealthier classes, eighty offspring survive at that age period. Before the war, in the obstetric clinics, 75 per cent. of the births were illegitimate, and 25 per cent. legitimate. Now the condition is exactly the reverse. Housing conditions are mainly responsible. But this in itself is a potent factor in insuring systematic care being taken of the baby, and of its mother before she has been delivered of this child. By what precautions might it be effected that only healthy children are born? The municipality of Vienna has undertaken the task of having all pregnant women examined as to syphilis and mental diseases, and at present about 50 per cent. of all these presumptive mothers are controlled. All hygienic and prophylactic measures of this kind must have one object in mind: The welfare of the future generation.

Statistics on Persons Insurable Against Sickness

There has been a law in Austria since 1888 which makes insurance against sickness compulsory for all persons who receive wages or a salary, up to a fixed sum of money, for monthly, weekly or daily work. It has been always the endeavor of the medical profession to keep the wage limit that entitles one to insurance as low as possible, and a fight is still raging between the government and the profession on that point. It is interesting to know how many people at present come under this law. We have a total of 221 *Krankenkassen* in our republic, comprising 1,524,546 members (Jan. 1, 1924). There exists, in addition, a *Krankenkasse* for (1) persons in state service; (2) in railway service, and (3) persons employed by the municipality of Vienna. The latter institutions insure not only the officers of the respective corporations, but also their dependents who live in the same household. All of these make a sum total of 2,316,519 insured persons, of which the last three services comprise, respectively, (1) 175,728 members, 209,427 family members; (2) 150,000, 179,000; (3) 36,119, 41,699. As the total population of Vienna is 1,800,000 of whom 1,100,000 are insured (over

60 per cent.), and as all Austria has 6,500,000 inhabitants, with 2,300,000 insured (35 per cent.), it is evident that private practice is much more handicapped in the capital than in the country.

The Housing of Tuberculous Patients in Sanatoriums

In lectures on tuberculosis delivered by Professor Schiff and Dr. Götzl at recent meetings of the Vienna Medical Society, figures were presented on the number of beds available for tuberculous patients in Austria. It appears that the number of sanatorium beds is far from being satisfactory at present; although not all the institutions are on a profit basis, especially those of the state, the provisions for private patients are better than for the members insured against sickness. There are, all told, 5,100 beds devoted solely to tuberculous patients, and of these 3,000 are owned by Vienna corporations. It is interesting to compare the number of insurance members and sanatorium beds. We find that 1,100,000 insured persons must be accommodated, when ill, in 1,765 beds, and that the remaining 700,000 people of Vienna have at their disposal 1,365 beds. In 1923 in Vienna 4,630 persons died of tuberculosis. We calculate the number requiring treatment in sanatoriums at five times as many, or 24,000, so that about eight persons in the private institutes have to occupy each bed each year. This means a stay of six weeks for each patient, if all patients are accommodated, a period decidedly too short; in other words, we need many more beds than we have at present. Regarding the condition of patients sent to sanatoriums, Dr. Holtei said that often patients expect to be admitted who are too far advanced to be permanently benefited or cured by their stay. It is chiefly the wage earner who, being afraid to stop earning because of the family, comes too late. In 1923, in one institute, 140 patients out of 463 who applied for admission had to be dismissed after a short stay, because they were too far advanced. On the other hand, patients often give their temperature wrong, and complain falsely of night sweats in order to prolong their stay, and thus occupy beds that should be used for severer cases.

BERLIN

(From Our Regular Correspondent)

July 12, 1924.

New Types of Welfare Centers

The city of Munich established recently a consultation and welfare center for the mentally sick. Its purpose is to give aid and advice to the mentally sick who have been released from institutional care and supervision. They will be helped to secure employment, and an endeavor will be made to prevent recurrences as far as possible. To attain this end, medical consultation hours are provided and the patients are visited in their homes, which affords an opportunity to advise with the other members of the family. The domiciliary visits are usually made by a welfare worker (commonly a woman) associated with the welfare physicians. The services of the welfare center are gratuitous.

A similar welfare center for the mentally sick, including the feebleminded and psychopaths, has been created in Stettin.

Another innovation is the establishment in Berlin of a public consultation center on marriage relations. It is located in the Institute for Sexual Science, founded and conducted by the sexologist Magnus Hirschfeld. Persons contemplating marriage are advised (1) with respect to their personal health and adaptation for marriage in general; (2) in regard to their sexual fitness as spouse, and (3) relative to their eugenic adaptation as parents. Advice is given also with reference to marital difficulties of a sexual or of a general psychic character, as well as in all questions pertaining to the training of children, from the physical and mental standpoint. A similar marriage consultation center has been created in Dresden at the Technische Hochschule (polytechnic).

The *Allgemeine Ortskrankenkasse* (local health insurance society) of Dresden has decided to provide its members, without extra charge, with the privilege of securing advice on marriage relations at the marriage consultation center of the Hygienic Institute of the Technische Hochschule, Dresden, which is under the direction of Dr. P. Kuhn. This decision affords the tens of thousands of members of the local health insurance society the opportunity of getting free advice on marriage problems.

The Condition of Health of School Children in Prussia in the Second Half-Year, 1923

On the basis of an inquiry instituted by the Prussian Ministry for Public Welfare, the ministerial counselor of this ministry, Dr. Koenig, publishes findings which throw light on the effects on Prussian school children of the food scarcity and high prices of foods in the second half of 1923.

Of 38,033 school children concerning whom reports of school physicians are available, only 32 per cent. were well nourished; 45 per cent. were inadequately nourished, and 23 per cent. were poorly nourished. According to reports from twenty-three Prussian government districts, which comprise a population of about 20,000,000 inhabitants, of 1,051,062 school children examined, 34,358, or 3.27 per cent., were tuberculous. According to the reports of the English committee of inquiry, during the last quarter of 1923, sixty-seven children out of a thousand died from tuberculosis in London, 117 in Munich, 124 in Berlin and 148 in Mainz.

Furthermore, undernutrition, combined with the dearth of shirts and the means of keeping clean, has brought about a considerable increase of cutaneous diseases; especially, scabies, skin eruptions and furunculosis, as well as pediculosis, in school children.

Marriages

HERBERT FOSTER GAINES, Birmingham, Ala., to Miss Slaton Scott McKillop of Mulberry, Fla., at Lakeland, Fla., July 5.

FRANK A. PADEN, Hartington, Neb., to Miss Elizabeth Oberlander of Coleridge, Neb., at Yankton, S. D., recently.

LOUIS GINSBURG, Johnstown, Pa., to Miss Esther Kremer of Perth Amboy, N. Y., at New York, early in July.

DONALD C. CONZETT, Chicago, to Miss Helen Jane Castleman of Elmhurst, Ill., at Chicago, June 10.

BLAIR POINTS, Luther, Okla., to Miss Violet White of Vandalia, Ill., at Luther, Okla., April 20.

ESTER M. SUNDELOF, Boston, to Rev. Eric G. Ericson of New York, at New York, July 21.

ISAAC WALTER ALLEN to Miss Dorothy Kirk, both of Noah, Utah, at Salt Lake City, July 14.

JOSEPH J. RUVANE, Jersey City, N. J., to Miss Anna A. Sullivan of Brooklyn, July 25.

HUGH JACKSON MORGAN, New York, to Miss Robbie Porter of Asheville, N. C., July 22.

JOHN L. TAYLOR, Waukegan, Ill., to Mrs. Crystal Eaton of Libertyville, Ill., June 14.

CLAUDIUS L. SIEVERS, Denison, Iowa, to Miss Gladys Nelson of Kiron, Iowa, June 18.

WILLIAM H. NORTON, Troy, Mo., to Miss Flavian James, Springfield, Mo., July 8.

MAURICE P. CHARNOCK to Miss Agnes K. Sloan, both of Philadelphia, July 12.

GEORGE J. MAUTZ to Bessie L. Grant, both of Springfield, Ill., July 11.

WILLIAM A. MICHAEL to Miss Garnet Groff, both of Peoria, Ill., June 7.

Deaths

Edmond Souchon ✠ New Orleans; Medical Department University of Louisiana, 1867; died at his home, August 5, aged 82. Dr. Souchon was visiting surgeon to the Charity Hospital, 1867-1906, and member of the board of administrators, 1880-1882; demonstrator of anatomy (1874-1876), and professor of anatomy and clinical surgery, Medical Department, Tulane University of Louisiana, 1885-1907. He designed and superintended the erection of the buildings at Tulane University School of Medicine and founded the Souchon Museum of Anatomy. He was president of the state board of health, 1898-1906, a fellow of the American Surgical Association, member of the Association of American Anatomists, the author of many articles on surgery, and emeritus professor of anatomy and clinical surgery at Tulane. Dr. Souchon was retired on a Carnegie pension, 1907.

Dudley Allen Sargent, Cambridge, Mass.; Medical Institution of Yale College, New Haven, Conn., 1878; director of the Hemenway Gymnasium 1879-1919, and assistant professor of physical training at Harvard University, Cambridge, Mass., 1879-1889; director of the Normal School of Physical Training, Cambridge, Mass., 1881-1916; president of the Sargent School for Physical Education and of the Sargent Camp, Peterboro, N. H.; inventor of modern gymnasium apparatus; author of Universal Test for Strength, Speed and Endurance, and many other works on physical education; member of the American Academy of Medicine; died at Peterboro, N. H.; aged 74; of heart disease.

Robert Grier LeConte ✠ Philadelphia; Department of Medicine, University of Pennsylvania, Philadelphia, 1888; fellow and former president of the American Surgical Association, and fellow of the American Association of Clinical Surgeons; on the staff of the Pennsylvania, Children's, Bryn Mawr, and Germantown hospitals; member of the Philadelphia Academy of Surgery, the Philadelphia Pediatric Society, the National Tuberculosis Association; served in the World War; aged 59; was found dead in his office of a bullet wound, presumably self-inflicted, August 6.

John Franklin Critchlow ✠ Salt Lake City; Department of Medicine University of Pennsylvania, Philadelphia, 1894; formerly president of the Utah State Medical Association, for twenty-five years on the staff of St. Marks Hospital; division surgeon for the Western Pacific Railroad; died as the result of an automobile accident, July 24; aged 56.

Philip Challis Bartlett ✠ Newton, Mass.; Tufts College Medical School, Boston, 1900; formerly on the staff of the Massachusetts General Hospital, superintendent of the State Sanatorium at Glenncliff, and head of the Framingham health center; member of the National Tuberculosis Association; died suddenly at his home, July 25; aged 49.

Duncan Lee Despard ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1901; on the staff of the Episcopal Hospital; assistant professor of surgery at his alma mater; member of the Philadelphia Academy of Surgery; died in the Polyclinic Hospital, August 5, aged 55, as the result of a bullet wound inflicted by a former patient.

Grace Harriet Campbell ✠ Chicago; Woman's Medical School of Northwestern University, Chicago, 1899; on the staff of the Mary Thompson Hospital; formerly an associate in pediatrics at Rush Medical College, and president of the Medical Woman's Club; died suddenly at her summer home, Fennville, Mich., August 1; aged 46.

T. Henry Davis, Richmond, Ind.; Homeopathic Medical College of Missouri, St. Louis, 1869; formerly president of the Indiana State Board of Health, president of the medical staff of the Reid Memorial Hospital, and health officer of the city of Richmond; member of the Indiana State Medical Association; died recently; aged 88.

Caleb Jones, St. Paris, Ohio; Cincinnati College of Medicine and Surgery, Cincinnati, 1876; formerly head of the Niles Sanitarium, Urbana, Ohio; also a druggist; president of the Farmers and Merchants Telephone Company, St. Paris; died, July 26, of heart disease; aged 73.

Joseph R. Broome ✠ New York; Medical College of Ohio, Cincinnati, 1888; formerly a practitioner in Utica; for many years editor of the medical department of D. Appleton and Company, New York; since 1923 a publisher of medical books; died, July 12; aged 57.

Samuel Arnold Minnich, Greenville, Ohio; Long Island College Hospital, Brooklyn, 1882; formerly a practitioner in Brookville; for forty years a teacher in the Dayton public schools; died suddenly at Dayton, July 20; aged 76; of apoplexy.

James Francis Chapman, Mount Kisco, N. Y.; Medical Department of Columbia College, New York, 1869; formerly examiner for the Equitable Life Insurance Company; died, July 14, aged 80, following a long illness.

Holland C. Weaver, Rule, Texas; Chattanooga Medical College, Chattanooga, Tenn., 1900; member of the State Medical Association of Texas; died, July 7, aged 46, of septicemia following an abrasion.

Julius Franz Kowsky ✠ Chicago; Dearborn Medical College, Chicago, 1906; on the staff of the Robert Burns Hospital; died suddenly, August 1; aged 46, of heart disease while enroute to Honolulu.

Norton W. Jipson ✠ Chicago; Chicago Medical College, Chicago, 1889; on the staff of the Lakeside Hospital, member of the Chicago Historical Society; died suddenly at his home, August 5; aged 58.

Thomas H. Mulvey, Louisville, Ky.; Kentucky School of Medicine of Louisville, Louisville, Ky., 1903; died, July 27, following an operation at the SS. Mary and Elizabeth Hospital; aged 46.

Carter William Ward, Leonora, Kan.; University of Kansas School of Medicine, Rosedale, Kan., 1910; member of the Kansas State Medical Society; died suddenly in his office, June 4; aged 39.

George N. Snyder, Springfield, Ohio; Charity Hospital Medical College, Cleveland, 1868; for many years a practitioner in Lagrange, Ohio; died, July 24, aged 79, of cerebral hemorrhage.

Samuel L. West ✠ St. Clairsville, Ohio; Medical College of Ohio, 1883; president of the board of education and of the Belmont County Board of Health; died, July 29, aged 64, of apoplexy.

Adelbert A. Getman, Chaumont, N. Y.; Albany Medical College, Albany, 1871; member of the Medical Society of the State of New York; died, July 25, aged 73, of diabetes mellitus.

Richard Henry Stuart, Jr., Colonial Beach, Va.; University of Virginia Department of Medicine, Charlottesville, 1907; died at a hospital in Staunton, July 19; aged 40.

George Napoleon Beal, Millinocket, Me.; Bowdoin Medical School, Portland, Me., 1919; member of the Maine Medical Association; died, July 15, aged 33, of typhoid fever.

James W. Robbins ✠ Naugatuck, Conn.; Bellevue Hospital Medical College, New York, 1880; died, July 20, aged 66, following a long illness.

Alonzo Ward Hill, Freewater, Ore.; University of Michigan Medical School, Ann Arbor, Mich., 1876; also a druggist; died, June 26; aged 73.

James Samson, St. Petersburg, Fla.; Victoria University Medical Department, Toronto, Ont., Canada, 1868; aged 81; died, July 16.

William H. Fraser, Bradford, Ark.; Memphis (Tenn.) Hospital Medical College, 1904; aged 46; died, July 21, at a local hospital.

F. W. Storey, Arp, Texas; Emory University School of Medicine, Atlanta, Ga., 1889; aged 58; was found dead in bed, July 21.

Henry A. Haley, Champaign, Ill.; Chicago Homeopathic Medical College, Chicago, 1882; died, July 19, of senility; aged 94.

Eugene Elmer Williams, Moodus, Conn. (licensed, Connecticut, 1893); aged 61; died, July 23, following a long illness.

Charles W. Hunt, Brevard, N. C.; College of Physicians and Surgeons, Baltimore, 1880; died, July 20; aged 65.

Francis Marion Halbert, Gulfport, Miss.; Jefferson Medical College of Philadelphia, 1880; died, July 21; aged 68.

John A. Vincent Sweeney ✠ New York; Long Island College Hospital, Brooklyn, 1882; aged 67; died, July 22.

Henry A. Furniss, Galena, Ohio; Columbus Medical College, Columbus, Ohio, 1876; died, July 18; aged 69.

Charles Wesley Taggart, Winthrop, Me.; Medical School of Maine, Portland, 1873; aged 75; died, July 20.

Maria Edmond Hincks, New Orleans; Pulte Medical College, Cincinnati, 1882; aged 73; died, July 20.

Henry Berton Hardman, Joplin, Mo.; Lincoln (Neb.) Medical College, 1898; aged 48; died, July 13.

John B. Grigsby, Nough, Tenn. (licensed, Tennessee, 1889); aged 75; was shot and killed, July 14.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

YADIL

An International Fake of British Origin

"Yadil" is "Tono Bungay" 1924 model with one Alex Clement as Edward Ponderevo. To paraphrase H. G. Wells: "Astraddle on Yadil he flashed athwart the empty heavens like a stupendous rocket." To the student of charlatanism it might be interesting to trace the commercial trajectory of Yadil's inventor from obscurity to obscurity. At present the Yadil rocket is a vivid piece of nostrum pyrotechnics—but the stick will come down.

Yadil (pronounced "Yah-dil," according to the makers) is not advertised in the crude style of "Beecham's Pills" or "Kruschen Salts." Rather does the advertising campaign remind one of "Sanatogen" in those palmy days when the public could be persuaded to pay a dollar for a few cents' worth of casein. As "Sanatogen" was the apotheosis of cottage cheese, so Yadil is supposed to be a glorified and esoteric form of garlic. We say "supposed to be" because, as it will be learned later, there is practically no garlic in the stuff. Part of the Yadil advertising campaign is an alleged history of garlic as a curative agent covering the not inconsiderable period of from 3500 B. C. to A. D. 1924. Just what the theory of its use may be is not clear. Possibly the basic idea is that no self-respecting germ will want to tarry in an organism saturated with garlic.

Yadil is put on the market by Clement and Johnson, Ltd., of London whose board of directors are said to be:

Joseph G. A. Clement	Pierce A. Arnold
Charles S. Baring-Gould	Joseph Marcel Clement
Wallace J. Bartholomew	Jack Giffard
Raymond T. Matthews	

The concern has a subsidiary company for its publicity features known now as the "Yadil Press, Ltd.," but formerly called "Quality Press, Ltd." The directors of Yadil Press, Ltd., are given as:

Alex. Clement (also chairman and managing director of Clement and Johnson, Ltd., and the chief publicity man)
Sir Douglas Egremont Robert Brownrigg, Bart., C.B.
Major-General Sir George Townshend Forestier-Walker, K.C.B.
Major Robert Chaloner Critchley Long, D.L., J.P.
Lieutenant-Colonel Jack Giffard (also assistant managing director of Clement and Johnson, Ltd.)

The American agents are E. Fougera & Co., Inc., of New York, and Yadil is advertised in the United States only in a small way. In the British Isles, however, newspapers and especially magazines that appeal to the intelligentsia, are carrying full page and double page spreads of Yadil—for tuberculosis, for cancer, for scarlet fever, for gonorrhea, for what-have-you. Thus *The Nation and The Athenaeum* for June 7 carries a full page advertisement on "Yadil and Cancer." In this advertisement, Alex Clement the alleged discoverer, although careful not to make the flat-footed statement that Yadil will cure cancer, carries the thought by every method of implication. The *Weekly Westminster* for May 17 in a two page advertisement on "Yadil and Cancer" details an alleged case of inoperable cancer of the stomach which, under the Yadil treatment, was said to have disappeared.

More than a year ago the *New Leader* carried a full page advertisement for Yadil in which Alex Clement claimed that the problem of tuberculosis was solved. In this same advertisement Clement also declared that bronchitis, pneumonia, inflammation of the bladder, malaria, scarlet fever, typhus, diphtheria, pernicious anemia, meningitis and several other conditions "are merely symptoms of one common disorder—internal infection." Then:

"Yadil destroys the internal infection and the symptoms disappear. That's all. This law is sound. It simplifies the practice of medicine. It safeguards patients against the dangers of wrong diagnosis."

Clement's theory is not original with him. It has been made by other quacks. Its very simplicity makes it plausible to a public that has not a groundwork of even elementary pathology.

A rather pretentious piece of advertising is the volume called "The Yadil Book." It is not free but sells for half-a-crown (about 60 cents). The average "patent medicine" exploiter feels well repaid if he can get the public to swallow a lie furnished gratis. In the Yadil book Clement develops the thesis that under our present economic system it is to the interest of the medical profession that there should be plenty of sickness. As he puts it: "Where doctors are compelled to live by disease, they cannot afford to explain how to live disease free."

In addition to the Yadil book another elaborate piece of advertising has been put out by the Yadil concern through its subsidiary "Quality Press, Ltd.," now called "Yadil Press, Ltd." This purports to be a scientific report and is entitled "Manchester Test of the Yadil Treatment of Tuberculosis in 100 Cases." The thing is printed so as to resemble in "make-up" the reports of select committees appointed by Parliament and printed under the authority of the government. It is of the same general size and has the characteristic blue paper cover with which such reports are bound. This "report" is being circulated not only in the British Isles but also in the United States.

The London correspondent of THE JOURNAL has already called attention to the Yadil advertising campaign in the British Isles and has pointed out that Alex Clement, the exploiter, has made frequent attempts to work the British medical profession in the manner typical of the nostrum vendor, but that our British confreres failed to rise to the bait.

There is no better way of giving an idea of the scientific status of Yadil than that of quoting some of the claims made for it:

"The medical evidence received during the last seven years proves conclusively that . . . Yadil destroys the tubercle germs—and other disease germs—within the body, without the slightest risk of injury to cell tissue."

"All cases of consumption not complicated by pent-up fluid in lung-cavities are curable at home with a relatively small quantity of the antiseptic."

"I propose . . . to make known to every victim of consumption in the British Isles that Yadil will cure them."

"Yadil Antiseptic destroys all disease germs, including the tubercle germs, the malaria germs, the smallpox germs, in the body without causing the least injury to internal organs—just as carbolic acid destroys all forms of disease germs in drains and dust-bins [garbage cans]."

"Stomach cancer upon which a surgeon at Tottenham Hospital said it was useless to operate disappeared under the Yadil treatment for cancer."

"Yadil treatment for cancer . . . is simple, inexpensive, safe and based upon common sense."

"DIPHTHERIA.—Mix one tablespoonful of Yadil with three tablespoonfuls of honey or syrup."

The sale of the product depends wholly on advertising. It contains no seductive or habit-forming drug to produce a "repeater" effect. Yadil is bought because the public is hypnotized with the lies told about the product. Publicity, therefore, is the lifeblood of the business. As has already been mentioned, many British newspapers and magazines have willingly shared the profits of quackery by selling their space to advertise Yadil. There is at least one British newspaper, however, that has refused advertisements of this nostrum—the *Daily Mail*, a paper that is said to have the largest circulation of any newspaper in the British Isles. But the *Daily Mail* has gone further than merely negative virtue. In its issue of July 22 it publishes an exposure of Yadil written by no less an authority than the senior professor of chemistry in the University of Cambridge, Sir William J. Pope, F.R.S., M.A., D.Sc., LL.D. Prof. Pope handles Yadil without gloves and calls a spade a spade. The manufacturers claim that Yadil has the chemical designation "Trimethenal Allylic Carbide" and declare that "it is entirely of harmless vegetable origin, its active principle being natural essential oil of garlic." Prof. Pope after analyzing Yadil states unequivocably that:

1. Yadil Antiseptic is not trimethenal allylic carbide.

2. Yadil Antiseptic consists of about 1 per cent. formaldehyde, 4 per cent. of glycerine, 95 per cent. of water and a smell.

The smell, says Sir William Pope, can be closely imitated by adding to one hundred tons of water one ounce of oil of garlic. He states, too, that while the nostrum is sold at the rate of about $20 a gallon, a mixture similar to Yadil and made with distilled water could be prepared for 36 cents a gallon. After showing that "Trimethenal Allylic Carbide" does not exist and that the term itself is an absurdity and after demonstrating that Yadil is essentially a one per cent. solution of formaldehyde, Sir William Pope discusses the testimonials, both from physicians and from laymen, and shows the utter worthlessness of the testimony. He closes his article with the statement:

"It should be made impossible for a secret remedy to be sold as a certain cure for consumption and cancer, especially when that remedy contains such a poisonous substance as formaldehyde and is recommended for consumption by babies and invalids generally."

The *Daily Mail* followed up its first article with a second one from Prof. W. E. Dixon, M.A., M.D., F.R.S., who is Reader in Pharmacology in the University of Cambridge. Dr. Dixon reviews Sir William Pope's exposure and discusses the medical point of view of the matter. He emphasizes that the basic drug in Yadil is an irritant poison with a cumulative effect. He declares that the "Manchester Test" report put forth by the Yadil concern "is, from the medical standpoint, nonsense" in that no evidence is offered that any of the patients benefited by the treatment. He concludes by expressing appreciation of the work of the *Daily Mail* in exposing "a cruel fraud on anxious people who have little money to waste."

It now remains to be seen whether the present efforts made by the exploiters of Yadil to foist this wretched nostrum on the American public will be a success. If the concern is willing to spend as much money on printers' ink in the United States as it has spent in the United Kingdom Yadil will doubtless be swallowed, literally and figuratively, as avidly here as across the water. But the advertising appeal will have to be different. Any attempt to feature Yadil as a cure for consumption or as a cure for cancer would bar this nostrum from even the less squeamish newspapers of the United States. For instance, the advertisement, "Yadil and Cancer," that appeared in the leading organ of the British intellectuals, *The Nation and The Athenaeum*, a few weeks ago would never have been accepted in the United States even by the *Police Gazette*.

The exposure of Yadil appeared in the *Daily Mail*, July 22 and 23. A few days later the proprietors of the nostrum began action for libel against the newspaper, Sir William Pope and Prof. Dixon. They did more than this. On July 29 the Yadil concern applied to the courts for an interim injunction to restrain the *Daily Mail* from publishing further exposures on the "patent medicine." The application is being opposed by the *Daily Mail* on the ground that it will fully justify itself for the statements published against Yadil.

The libel dodge is an old one. A few years ago scarcely a month passed that some "patent medicine" faker did not start an action for libel against THE JOURNAL or threaten to do so. In practically every case only the præcipe was filed and the matter was never heard of again; but it served its purpose. In every newspaper carrying advertisements of the "patent medicine" in question "news items" appeared giving the impression to the public that the American Medical Association had been mulcted in damages. Yadil will, doubtless, try the same dodge and, presumably, the newspapers that are deriving handsome revenues from this source of quackery will do their best to let the British public believe that Yadil has been wickedly libeled. "Whose bread I eat, his song I sing."

Seat of Higher Mental Functions.—The association areas of the human brain are the fields for all the higher mental functions—such as thought, memory, reason and speech. The capabilities of the human individual in these directions will differ according to the number and mode of connection of fully developed functioning neurons within these areas.—J. A. Berry: *Brit. M. J.* **1**:710 (April 19) 1924.

Correspondence

"CURRENT CRITICISMS OF MEDICAL EDUCATION"

To the Editor:—Dr. Pusey's point in his comment (THE JOURNAL, August 9) on the editorial "Current Criticisms of Medical Education" is well made. In your editorial you take no account whatever of the specific recommendations in the way of medical education and supply of physicians for places in need of them which Dr. Pusey made in his notable address as President-Elect of the Association. These suggestions were definite and specific, and evidently made as the result of much thought. Personally I subscribe to them as being most promising in the way of amending our present difficulties, and indeed our dangers.

If Dr. Pusey is wrong, this ought to be shown. Surely the suggestions of the President of the American Medical Association when definite, specific and somewhat radical ought to be supported and tried out, or they ought to be rejected. It is not fair to Dr. Pusey nor to the Association nor to those who, like the writer, are deeply interested in the subject, to pass over it by such general comments as you make in the editorial to which I have referred. Let us hear from the Council on Medical Education. The subject is a live one—not a threshed out one.

THEODORE DILLER, M.D., Pittsburgh.

THE PREVALENCE OF "EVALUATE"!

To the Editor:—Is there an especially comprehensive, or technical, or medical, meaning to the word "evaluate" which causes it to appear in so many recent medical papers? Or does it, like the economic coinage "normalcy," just appeal to many?

DAVIS FURMAN, M.D., Greenville, S. C.

[NOTE.—Probably the latter. It has long been known to philologists that there is a tendency for words to be taken up and widely used over short periods, and then discarded for more popular words. In other words, there is a style in words as in other phases of human existence.—ED.]

FACTS REGARDING ALLEGED OPERATION ON SIAMESE TWINS

To the Editor:—July 18 and 19, newspapers contained accounts of the birth of Siamese twins at the Borough Park Maternity Hospital; also varying accounts as to the physicians' skill in saving the life of one of the twins.

July 10, at 6 p. m., I was called to attend the patient, after the membranes had ruptured. Abdominal examination revealed a twin pregnancy with breech presentations. The right fetal heart was heard above the umbilicus, the rate being 150 a minute, and the left fetal heart above the umbilicus, the rate being 90 and the quality of sound poor. No active labor pains occurred until July 11 at 7:30 p. m., when the patient was removed to the hospital. Vaginal examination on entrance to the hospital showed the cervix fully dilated, and buttocks and foot presenting. The breech was delivered to the shoulders, and the head was extracted according to the Smellie-Veit method, with pressure over the pubic region. This breech presentation was a living male baby, weighing about 5½ pounds. Examination of the baby after the umbilical cord was ligated and cut showed a ventral hernia about 3 inches in diameter, and a malformation of the penis—just a tab of erectile tissue with two urethral openings at the top. The scrotum and testes were well formed. This living baby was born at 1:30 a. m., July 12. Twenty minutes later, about 1:50 a. m., the placenta presented itself at the

vulvovaginal orifice, but the patient had slight uterine pains and could not expel it entirely. It finally was crowded out of the vaginal orifice by the Schultze method at 2 a. m., and the Credé procedure was not necessary.

There now presented at the side of the placenta two fetal hands and the intestine of the monster fetus. After the placenta was removed, I extracted the monster fetus in the breech manner.

Examination of the placenta showed two umbilical cords, one long cord measuring from 12 to 14 inches, from which the living fetus was receiving its nourishment, and a marginal short cord of from 4 to 6 inches, which was attached to the monster fetus.

In the monster fetus, the head, upper extremity and chest were deformed. The abdominal viscera were covered by a thin layer of peritoneum. The left lower extremity was absent and the right lower extremity seemed to extend from the end of the spine, pointing toward the head.

Contrary to statements in the press, in the delivery of the first breech I experienced no difficulty and did not need assistance or resort to any surgical procedure, as the normal mechanism of breech delivery was sufficient. The dead fetus was attached to the placenta through a short umbilical cord, and in no way attached to the living baby. No surgical operation was performed by me or by Dr. Mininberg to separate the babies, as they were not attached and not born so.

This was not a "Siamese twin birth."

Morris Goldberg, M.D., Brooklyn.

AMERICAN PHYSICIANS WITH BRITISH TROOPS

To the Editor:—For the past year I have been gathering data for a comprehensive survey of the services of American medical officers who were assigned to the British during the war. Through various sources, the information gathered has been gratifying, but many men now in practice have subject matter which should be in this book. I hesitate to continue until all means of collecting authentic information have been exhausted. It would be decidedly unfair to omit any possible contributions. I take this means of bringing to the attention of those men who were with the British in the field my interest in their experiences or those of men they knew. Contributions should consist of a narrative, with names of places, men, outfits and dates. These articles will blend one with the other and make an interesting history of those 1,400 men who served under a foreign flag. No man can do this work alone, and no one man can tell the story for all.

W. A. R. Chapin, M.D.,
121 Chestnut Street,
Springfield, Mass.

"THE ENDOSTEUM"

To the Editor:—In my letter on this subject (The Journal, July 26, p. 289), that portion of it which asked for some concrete evidence of the existence of any such structure as an endosteum was elided, though it was the nubbin of the whole matter. Leaving this out, you publish Dr. Haas' erudite answer, giving various opinions and theories of different authorities, with a learned disquisition on the subject of bone formation in general. This whole matter illustrates well the great difficulty of establishing the treatment of diseases of bones and joints on a rational basis. We have little else but theories and opinions to guide us. Some eminent authority expresses an opinion. It is accepted as a fact, and perhaps an elaborate treatment is based on it. When we seek for a foundation of the treatment, we find that there is none.

Perhaps, instead of asking for information, I also should have stated a fact in my former communication. As the result of much laboratory work for many years, I have come to the conclusion that there is no such structure as an endosteum. Like the cambium layer of the periosteum, it has no existence except in the imagination of those who like to think it is there. I deny its existence, and challenge the production of proof on the other side. Gray does not mention it, except in connection with the dura mater. If one looks at slides of bone under the microscope, one sees many osteoblasts or bone cells in and on the trabeculae, and in, and on the outside and inside of the cortex, but no definite structure in the form of an endosteum can be detected. Endosteum is simply marrow.

Leonard W. Ely, M.D., San Francisco.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

LERCH'S DROP PERCUSSION METHOD

To the Editor:—In his article on the size of the normal heart (The Journal, June 21, p. 2016), Fossier states that he employs Lerch's drop percussion method, but does not sufficiently describe the technic of the method. As I am unable to readily secure the articles referred to in the bibliography, I would appreciate certain information concerning details of Lerch's drop method. The author states that "the sounds are heard, the resistance is felt, and the vibration of the hammer may be seen." He further says, "A hammer and pleximeter are necessary to obtain good results." 1. If both plexor and pleximeter are used, how is it possible to feel the resistance? 2. What type and size plexor is recommended best to bring out the vibrations? 3. What are the size and type of pleximeter used? 4. Has this method been used to advantage by individuals in the determination of pulmonary infiltrations?

Robert L. Daniel, M.D., Waynesville, N. C.

Answer.—The questions propounded are best answered by the following quotation taken from the article by Otto Lerch, "My Method of Percussion" (*International Clinics* **4**, Series 25):

Hammer and plessimeter are used, but, instead of the stroke, a drop. The principle of this method is different from all others now in use, and its employment excludes every personal factor. A drop is a drop in every hand, and the result must be the same if the hammer is allowed to drop from the same height. The difference of opinion as to the quality of the percussion stroke, whether light or strong, which depends on the judgment of the examiner, is entirely eliminated and the method yields a uniformity of result which can not be obtained with any other.

The sound produced by the drop, passive, is therefore far more delicate and defined than the one produced by a stroke. The method unites palpation, also passive, with percussion. The most minute changes of vibration are felt in the fingers that hold the plessimeter, and the hammer feels heavy when the border of the solid organ is reached, light when an organ filled with air is percussed. Finally, the eye controls the impressions received by ear and touch. The rebound of the falling hammer changes with the change of vibrations; it depends on the elasticity of the medium percussed. The hammer rests like dead upon the surface when absolute heart dulness or liver dulness is percussed, and rebounds, frequently, when the relative dulness of these organs is determined.

The hammer consists of a steel head with black rubber tip and a light wooden or hard rubber handle. The rubber tip must not be too hard and not too soft; a medium hardness gives the best results; its elasticity has to be tested. A thin, small ivory or celluloid plate, with vertical edges to hold it with forefinger and thumb, serves best as a plessimeter.

The method is suggested especially in the determination of pulmonary infiltrations, and in the percussion of abdominal organs.

"ETHYL GAS"—TETRA-ETHYL LEAD

To the Editor:—"Ethyl Gas Fluid" is used in gasoline to increase the "pep" of the motor. The places in which this fluid is sold exhibit a sign calling attention to the corrosive action on skin and suggest soap and water to be used immediately. Is there any chemical antidote? This fluid is sold by the Standard Company.

A. C. Benedict, M.D., South Orange, N. J.

Answer.—"Ethyl Gas Fluid" is gasoline to which has been added a small quantity of liquid containing as its chief constituent tetra-ethyl lead and also an organic chlorin compound so that the lead in the exhaust may be converted to lead chlorid; the gasoline usually contains a dye in addition

to serve as a warning that the gasoline contains this compound. The amount of tetra-ethyl lead is small, but has a decided influence on the rate of combustion in compression engines. It is the result of much experimental work by the General Motors Company; it is dispensed for the General Motors Company by various refining companies. As lead is considered a cumulative poison, inquiry was made from the General Motors Company concerning the possible toxic dangers from the use of this product along congested traffic lanes. In reply the General Motors Company wrote: "Although no data have been published, a comprehensive research on the possible danger to the general public from lead poisoning has been carried on by the Bureau of Mines in cooperation with the Department of Public Health. A preliminary report on this investigation will be available shortly. At present I may say that all indications are that there is no danger of acquiring lead poisoning through even prolonged exposure to the exhaust gases of cars using ethyl gas. Poisoning from carbon monoxid would arise long before the concentration of lead would reach a point where even cumulative poisoning is to be feared."

Inquiry was also addressed to the Bureau of Mines. Dr. R. R. Sayers, the chief surgeon of the Bureau of Mines, stated that the bureau, for some months, had been carrying out "investigations on the possible health hazard due to the use of tetra-ethyl lead in gasoline. These tests are not completed and, until a study is completed, it is inadvisable to draw conclusions as they may be reversed at any time."

We do not feel that there is necessity for the use of a chemical antidote when the arm is immersed in gasoline containing tetra-ethyl lead for a brief period; it is our opinion that the use of soap, as recommended, is the most advisable procedure.

CONTRACTS IN RESTRAINT OF PRACTICE

To the Editor:—If I employ an assistant, and he in the presence of a witness signs an agreement not to practice medicine or surgery in this town for a period of five years after I am through with his services, can I enforce this agreement by law? M.D., W. Va.

ANSWER.—Contracts of this general character are enforceable through the courts. Limitations as to the area and time within which the assistant is to refrain from practice must be no greater than are reasonably necessary to protect the practice of the principal from unfair encroachment. A contract in which a physician agreed not to practice medicine in a certain village or vicinity for a term of at least five years was upheld in *Timmerman* v. *Dever*, 52 Mich. 34. No opinion can be expressed as to the enforceability of the particular contract of which our correspondent writes, in the absence of exact knowledge as to its terms and as to the conditions surrounding it. If the contract is in contemplation, by all means one should employ competent local counsel to draft it and to see to its proper execution. If the terms of an existing contract are in dispute, one should exhaust every effort to arrive at a mutual understanding, by arbitration or otherwise, before resorting to the courts.

TREATMENT OF BURNS

To the Editor:—In an abstract of an article by Tomb on the treatment of burns with chlorinated lime (THE JOURNAL, June 7, p. 1895), a liniment is mentioned. Please give me the formula mentioned.

GEORGE B. TUTTLE, M.D., Waimea, Kauai, Hawaii.

ANSWER.—Tomb mixes equal parts of olive oil and a 10 per cent. solution of chlorinated lime, on the day of use, because the hypochlorites deteriorate. If this liniment should be too strong, the solution of chlorinated lime may be diluted with simple lime water before mixing with the oil.

SYPHILIS

To the Editor:—1. Is it possible for a syphilitic male having no visible lesions other than a four plus Wassermann reaction to infect a female? 2. If so, are the chances greater if the female becomes pregnant? 3. What percentage of children born of syphilitic fathers are syphilitic? 4. What percentage of children born of syphilitic mothers are syphilitic? 5. Is it possible for a nonsyphilitic mother to give birth to a syphilitic child? F. T. V., M.D.

ANSWER.—1. It is possible for a syphilitic with a positive Wassermann reaction and no visible lesions to produce infection. This will be due, however, from the transference of spirochetes from some active lesion. The likelihood of this occurring becomes less and less as the disease becomes older. In old syphilitic patients this possibility practically vanishes.

2. No.

3 and 4. There are no accurate statistics. It depends largely on the age of the syphilis in the father.

5. No. There is some tendency at present to question this answer, but the reasons are very strongly in favor of the fact that a nonsyphilitic mother cannot have a syphilitic child.

BENZOSULPHINIDUM (SACCHARIN) ON OATMEAL

To the Editor:—Will you kindly inform me whether saccharin can be used as a sweetening with breakfast cereals in a way to conceal its bitter taste? Two patients have attempted its use, in place of sugar, with oatmeal, but complain of a bitter taste.

CHARLES BUSEY, M.D., St. Joe, Idaho.

ANSWER.—Benzosulphinidum (saccharin) is about 500 times sweeter than sucrose. A dilution of 1:10,000 is agreeably sweet, but in a concentration of 1:1,000, it becomes bitter and disagreeable. Even with the more dilute solutions, the quality of the taste is somewhat different from sugar, and on continued use, the persistent after-taste often becomes quite objectionable. As oatmeal is very high in carbohydrates (milk or cream is also generally added), it would not seem that this food would be indicated when benzosulphinidum is indicated; i. e., in diabetes and obesity.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, Sept. 2. Sec., Dr. Harry C. DeVighne, Juneau.

MASSACHUSETTS: Boston, Sept. 9-11. Sec., Dr. Charles E. Prior, 144 State House, Boston.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Dr. Charles Duncan, Concord.

PORTO RICO: San Juan, Sept. 2. Sec., Dr. D. Biascoechea, San Juan.

Minnesota April Examination

Dr. Thomas S. McDavitt, secretary, Minnesota Board of Medical Examiners, reports the oral, written and practical examination held at Minneapolis, April 1-3, 1924. The examination covered 15 subjects and included 80 questions. An average of 75 per cent. was required to pass. Twelve candidates were examined and passed. Twenty-two candidates were licensed by reciprocity. Two candidates were licensed by endorsement of their credentials. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Rush Medical College	(1923)	90.9
Hospital College of Medicine, Louisville	(1907)	77.1
University of Minnesota	(1922)*	86.8,
	(1923) 86.9, (1923, 3),* 83.8, 88.2, 89.8,	(1924) 90
McGill University Faculty of Medicine	(1921)	86.4
University of Manitoba Faculty of Medicine	(1921)	91.2
University of Edinburgh, Scotland	(1911)	90.4
University of Basel, Switzerland	(1921)†	85.3

LICENSED BY RECIPROCITY College	Year Grad.	Reciprocity with
Loyola University	(1923)	Illinois
Northwestern University	(1900, 2), (1920),	(1921) Illinois
Rush Medical College	(1897) North Dakota, (1917),	(1920) Illinois
University of Illinois	(1923)	Illinois
State University of Iowa College of Medicine	(1921)	Iowa
University of Louisville	(1920), (1921)	Kentucky
Tulane University	(1895)	N. Dakota
Baltimore Medical College	(1910)	Washington
Harvard University	(1921)	Illinois
University of Michigan Medical School	(1920)	Michigan
Creighton Medical College	(1921)	Nebraska
University of Nebraska	(1921)	Nebraska
University of Pennsylvania	(1918)	Illinois
	(1921) Kansas, (1921)	Penna.
University of Pittsburgh	(1922)	Penna.

ENDORSEMENT OF CREDENTIALS College	Year Grad.	Endorsement with
Loyola University	(1923)	N. B. M. Ex.
University of Pennsylvania	(1918)	N. B. M. Ex.

* These candidates have completed their medical course and have received their M.B. degrees. They will receive their M.D. degrees on completion of a year's internship in a hospital.

† Graduation not verified.

Social Medicine and Miscellany

A PLAN OF HOME HOSPITALS FOR SICK INFANTS*

HENRY DWIGHT CHAPIN, M.D.
NEW YORK

After many years' hospital experience with infants and little children—exhibiting varying degrees of success and failure—I have reached the conviction that certain types of illness in this class rarely thrive under ordinary hospital care. Many sick and ailing infants are much better treated out of the hospital than in it.

The very structure and operation of the average hospital, both special and general, include conditions unfavorable to infant life. This question is especially bound up with problems involved in the constant change by rotation of interns and nurses, as well as the ever present danger from all kinds of cross infections. Steady, uninterrupted individual care is essential to the satisfactory nursing of infants at all times, but especially when they are sick. A peculiar and particular aptitude is required for the successful nursing of delicate and sick infants. Many nurses, in spite of training, never acquire this ability. Patience, watchfulness and a loving touch may succeed where the most rigid discipline fails. If a nurse once acquires such facility, she should be kept on the job for the good of the baby. The hospital routine will occasionally produce an adept, but it must be acknowledged that there are more of the other kind in the procession.

An important and necessary feature of a hospital's work consists in the training of young and inexperienced physicians and nurses, but constant change is frequently at the baby's expense. The education of physicians and nurses is naturally what calls them to the hospital, and cannot be neglected if their services are to continue; but as soon as they become fairly proficient, they are moved on to the next service, and a new and raw levy takes their place. Again, the "afternoon off" may occur at the critical time for a very sick baby, and a probationer is put in charge. The most careful attention to every little detail of care and feeding may be necessary to success in such a case. There is nothing so unstable and uncertain as a fragile baby.

With reference to cross infections, while theoretically they should not occur, actually, very few hospitals can boast of their absence. The common and constant danger is from contact infection. It would require an asepsis worthy of the operating room to prevent this accident at this most susceptible period of life. Needless to say, this is rarely found in medical wards. The inauguration of small units in place of large wards will diminish the risk from the droplet infections of such diseases as measles and whooping cough; but even then it is very difficult to prevent their entrance and spread in children's hospitals. Admission during the invasion period much increases the risk. As these diseases are so frequently followed by tuberculosis in malnourished children, it becomes a serious feature of this problem.

There is also the constant danger from auto-infection as well as hetero-infection in babies' wards. Perhaps this is seen most often in bronchopneumonia. The frequent recurrence and insidious spread of this disease are more marked in the hospital care of pneumonia than when the disease is treated outside. This has been shown by the records of the Henry Street Settlement nurses of New York, who work entirely in homes. As soon as a baby shows signs of resolution in any type of pneumonia, it should be promptly discharged from the hospital. Many necropsies that I have made in infants dying in the hospital show a terminal bronchopneumonia or hypostatic pneumonia in most kinds of fatal illness. There is also constant danger of reinfection in nearly every variety of the acute and chronic infections that send a baby to the hospital.

As success in hospital care for sick infants is subject to so many disturbing factors, some years ago I tried another plan. This consisted in sending out cases that were not doing well to some of the boarding homes in one of my Speedwell units. Unresolved pneumonias, intractable bowel disturbances, and similar conditions, were treated in these homes under the eyes of the physician and nurse serving in the unit. As the results were not favorable, or no better than the hospital treatment, the practice was discontinued. The foster mothers also frequently became demoralized in the presence of very sick or dying babies.

It recently occurred to me, however, that this plan might be worked out in a somewhat different form. This has consisted in carefully selecting a number of good homes with especially efficient foster mothers, who, under careful and special instruction, can adapt themselves to such a work, and thus form home hospitals. Extra care by physician and visiting nurse and extra pay for the foster mother are necessary corollaries of this effort. I believe there is a promising future for this plan in dealing with many cases of sickness in babies that would otherwise be consigned to the hospital. This would mean a very great restriction in the number of sick infants sent to a hospital. The hospital then need only be utilized for surgical operations, for a few severe illnesses requiring highly specialized nursing and treatment, or for scientific observation of obscure cases requiring much laboratory study. In most instances, a small ward can function efficiently and economically for cases requiring such special study or care.

Since working on this problem, I have been much interested in learning that, in 1912, the Association for Improving the Condition of the Poor in New York started a home hospital plan in the treatment of tuberculosis. The work has been done in model tenement houses, where families are housed when one or more of the members have tuberculosis. It has been found that nearly one third of the children in dependent families in which one or both parents have active tuberculosis are themselves already patients; much more than another third are delicate and undernourished and present some of the symptoms of tuberculosis in children.

Mr. John C. Gebhart[1] of the association has recently made a ten-year study of the work of this form of home hospital. His report shows that, so far as medical results are concerned, the home hospital has made a record which is comparable to that of the best sanatoriums in the country. On the follow-up of patients, with respect to those who are alive and able to work for various periods subsequent to discharge, the results of home hospital care are found to be better than those secured by various sanatoriums. The record further tends to prove that proper supervision and care of tuberculous families in their own homes is in the long run the most humane and the most economical. If a depressing and communicable disease such as tuberculosis can be handled successfully on the home hospital plan, it is certainly worth while trying to apply it in the case of infants who are so susceptible to hospitalism. We have been obliged, however, to work in individual apartments not located in model tenements.

The principal factor in the success of our plan consists in securing an intelligent and willing foster mother who will

* Read before the American Pediatric Society, Pittsfield, Mass., June 6, 1924.

1. Gebhart, J. C.: Personal communication to the author; data to be published.

carry out orders, always remembering that a moderately trained mother will often do better with a sick baby than an overtrained nurse or nun. Careful watching and nursing by such a mother under the direct supervision of physician and trained nurse follow.

The work began during the last year by selecting two good homes in the Yonkers' Speedwell unit. One of these homes is located on the first floor of a two-family house with good light and air and a spacious back yard. The foster mother is an intelligent married woman with one child. The other home is a small, two-story detached house with a little yard and garden that insure satisfactory light and air. The family, consisting of husband, wife and several older children, occupy the entire house. Twelve acutely sick babies have been satisfactorily treated in these homes instead of being sent to a hospital. Special history blanks and records are utilized by physician and nurse in this work. The cases were two of bronchopneumonia, three of acute gastro-enteritis, two of fermentative diarrhea and vomiting, and five of atrophy with chronic indigestion, requiring special formulas and feeding care. All the patients eventually recovered. A brief glance at two cases will show the type.

CASE 1.—F. F., aged 5 months, had bronchopneumonia lasting over two weeks, with a temperature varying from 101 to 104 F., complicated by enteritis and difficulty in feeding. Eventually the infant made a good recovery and even regained the weight lost in the illness.

CASE 2.—E. R., aged 2 months, affected with atrophy, with vomiting and diarrhea. At first the child was unable to retain any food, but a special lactic acid formula was tolerated, and later, modified milk was given. This was followed by gradual recovery.

Cases like these rarely do well in hospitals.

It has been more difficult to establish the home hospital in the congested tenements of New York, but still, a successful start has been made. Light, air and cleanliness are not so readily obtained. A trial was made of ten homes before Dr. Dowd, who has charge of the Spence Speedwell unit, was satisfied that two could be retained. Six very sick babies have been thus treated, with one death. The latter occurred in an atrophic baby of 8 months with general glandular enlargement and showing the status lymphaticus type. It had one infection after another, acute nasopharyngitis, double otitis media, bronchitis, measles, and finally gastro-enteritis. The measles was contracted in the boarding home from one of the children in the family. It has since seemed best to place sick babies in homes where there are no young children, so that the chances of hetero-infection may be lessened, and the foster mother may not be otherwise distracted. In a serious illness like pneumonia, the nursing must be done by a specially trained foster mother who has only that one case to look after, and in a very clean home. The five other cases mentioned above made a good recovery, three of bronchitis, two of whom had double otitis media, one of bronchopneumonia, and one of eclampsia. These cases all required very active service on the part of the physician, the visiting nurse and the foster mother. Two lumbar punctures were done and drums incised in the cases of otitis. Gavage feeding, bowel irrigations, temperature records, sponging for high temperatures, and other necessary procedures were successfully performed, as in the hospital. The patients were all rickety, malnourished babies that rarely last long under ordinary hospital care.

The exact form and operation that such a movement may eventually take must be a subject for future experiment. The scientific method of trial and error may be followed. I am convinced, however, that there are great possibilities in the general plan. One suggestion might be offered that hospitals handling sick infants select a number of promising homes in their immediate vicinity where they could treat many of these cases, or quickly transfer them from the wards when convalescent. The machinery of the hospital could thus be utilized by sending physicians and nurses into the surrounding homes. This would also have a directly beneficial effect on the neighborhood. It could operate much as the modern university extension acts in diffusing the knowledge and culture of the college. Community health centers might also utilize their medical and nursing staffs in the home hospital care for certain kinds of patients. It would be easy to link up home hospital service with any organization that could supply physicians and nurses already trained along somewhat similar lines.

There is one other feature of this work that may be noted: the comparatively small expense in reference to the results obtained. In hospital operation, efficiency must never be sacrificed to economy, but steadily mounting costs cause grave concern. Many self-respecting persons, of moderate means and with proper pride, cannot secure needed help for themselves or dependents from hospitals as they are now operated. The millionaire and the pauper are well looked after, but the large intermediate class has little offered that is within its means. A glance at the daily per capita cost of operation of some of the general and special hospitals in New York during the past year shows the following figures, according to the report of the United Hospital Fund: The daily per capita cost of eighteen general hospitals showed an average of $5.15; ten hospitals for women and children averaged $4.23; eleven special hospitals averaged 4.28, and some reached much higher figures. Even these amounts do not represent the real cost of the services rendered, as no estimation is included in these figures as to the capital tied up in the plant, the general depreciation of property, or the remitted taxes. If a sick baby is to have attention in a private or semiprivate room in one of these hospitals with any kind of individual nursing, the cost is prohibitive to many. At half, or less than half, the cost, a large proportion of illnesses in infants can be handled in the home hospital with equal or better chance of recovery.

The plan here advanced represents a more intensive effort along the lines carried out during the last twenty-three years in the Speedwell unit system of boarding out, and thus represents the natural evolution of an idea. As ordinary malnourished infants have done so well under this system, it has seemed that more special attention focused on a few promising homes should work well with acutely sick babies, and the plan can be operated anywhere and everywhere. The results are most promising at a minimum cost and without any outlay of capital. Human service is stressed aside from bricks and mortar.

51 West Fifty-First Street.

REPORT OF INTERNATIONAL HEALTH BOARD

The International Health Board of the Rockefeller Foundation, in 1923, cooperated with government agencies in health work in sixty-eight states and countries. The report of the general director, Dr. Frederick F. Russell, shows that the board's activities included the development of rural health organizations; the world-wide campaign against hookworm disease; a campaign against yellow fever in Mexico, Brazil, Colombia and other countries of Central and South America; cooperation in the health program of the League of Nations; the organization of facilities for training public health nurses in France, Brazil and the Philippines; the training of other public health personnel through schools of hygiene and fellowships; the development of public health laboratories, and field studies in malaria control in the United States and various tropical regions. Dr. Russell says that the International Health Board does not feel that any demonstration has been successful unless its assistance ceases to be needed

within a reasonable time, and that any project which is not absorbed into the official health service is obviously unsuited to the time or place. The report states that there were 230 counties in twenty-eight states of the United States that had full-time health organizations, and that in Ohio 48 per cent. of the counties had full-time organizations; Alabama, 32 per cent.; North Carolina, 31 per cent.; New Mexico, 27 per cent.; South Carolina, 21 per cent., and Georgia, 11 per cent. Only two years have elapsed in Brazil since the first full-time health unit started, but county health units are being established in several states. The government has cooperated with sixteen of the twenty states, and 225 projects are under way.

When several hundred cases of yellow fever were reported at Bucaramanga, Colombia, the board sent experts, on invitation from the Colombian government, to confirm the diagnosis and to institute control measures. New cases of yellow fever rapidly ceased to appear, and none have been reported since May, 1923. There was a serious epidemic in Ceara, Brazil, from 1921 to 1923, and the disease has been endemic in Bahia, where a total of 157 cases was reported, with thirty-nine deaths. The experience of 1923 shows, it is said, that the opening of branch state laboratories results in a rapid increase in the amount of work performed and the number of physicians served, and that no other activity of the health department produces so quickly an improvement in medical practice as the diagnostic laboratory, or brings to its support so many physicians. The board assisted in developing nine laboratories in seven states in 1923. A laboratory was opened in Honduras; Costa Rica is ready to establish one; in Nicaragua, a laboratory was conducted by a native staff throughout the year, and two branches have been opened; and in Salvador the work of the laboratory has been extended to include the examination of foods and drugs. Manila, Dr. Russell says, has long had the distinction of having one of the earliest and best equipped diagnostic laboratories anywhere in the world.

The campaign against malaria in the southern part of the United States started in 1917 in and about the army camps, and after the armistice this work stopped. It had been a war measure carried on regardless of expense, and the hesitation of small communities to undertake to keep this work up was easily understood. The International Health Board was able to show that malaria control need not be expensive, but that an average community can virtually rid itself of malaria at a per capita cost of from 45 cents to $1 a year, provided a careful preliminary survey is made to define the local problem. During the year the board's malaria control work was carried out on a county basis, and whenever possible the campaign was directed by the county health officer with the assistance of the state health officer. During 1923, seventeen new counties undertook antimalaria campaigns. The spleen index was shown to be a simple and reliable index of malaria. In Lee County, Georgia, a comparison of the spleen index, plasmodium index and the malaria history index of 571 persons examined, showed that the spleen index furnished a more sensitive measure of malaria than the blood index. Among these people the spleen index was 40.8 per cent., the plasmodium index 25.2, and the malaria history index 37.4.

The board cooperated with governments in twenty countries in the control of hookworm, and treatment was administered to 717,000 persons under the direction of the board's representatives. In Ceylon alone, 500,000 outpatients were treated for hookworm in 240 institutions. On the average, in all the twenty countries 80 per cent. of the persons examined were found to be infected.

Influenza Epidemics in Europe.—In Denmark there were nearly 25,000 cases of influenza in March as against about 10,000 in February; in Sweden about 2,300 in March as against 2,440 in February. The very marked epidemic in Switzerland is stated to have definitely ended, only seventy-five cases having been reported during the last week of April as against a weekly maximum of 5,563 at the end of February. In Spain 1,635 deaths were registered as due to influenza in February as against 853 in the same month of 1923.—*Pub. Health Rep.* **39**:1572 (June 27) 1924.

Book Notices

TRAITÉ D'HÉMATOLOGIE CLINIQUE. Par J. Rieux, Médecin principal de 1re classe. Paper. Price, 70 francs. Pp. 761, with 32 illustrations. Paris: Gaston Doin, 1923.

This comprehensive work is an enlargement of the author's "Précis d'hématologie" published in 1911, and aims to furnish the student of medicine with a knowledge of the methods of hematologic study and to point out to him the great importance of this field, which is so rapidly enlarging. To the clinician it offers an extensive guide in the diagnosis, prognosis and treatment of the many conditions associated with abnormalities of the blood. The book is divided into six parts, dealing with general hematologic technic, physiologic hematology, pathologic hematology, bacteriology and parasitology of the blood, and the principles and methods of blood transfusion. In the portion of the work devoted to technic, the usual routine measures for counting the cellular elements, for determining the hemoglobin, and for studying the fresh and stained specimens are given in fairly adequate detail, but the discussion of the chemical examination of the blood is far from satisfactory, and hardly mentions the vast amount of work done by our American investigators in elaborating methods for such study. The portion dealing with the serologic reactions appears unnecessarily brief in a work of such dimensions. The remaining sections of the book are entirely adequate, the discussions being clear and embodying the generally accepted ideas as to cytology, diagnosis, prognosis and treatment. The colored plates are especially worthy of mention, and should prove of great value to the student and practitioner. This work should be of interest to the clinician, although we doubt that the student would obtain as much value from it as from other works giving a more detailed technical discussion.

A MANUAL OF URINE EXAMINATION. For Students of Pharmacy and Nursing. By Florin J. Amrhein, Ph.G., Ph.C., Assistant Professor of Chemistry at the Massachusetts College of Pharmacy. Cloth. Price, $2. Pp. 201, with 50 illustrations. Philadelphia: W. B. Saunders Company, 1924.

This is intended to cover the course as given at the Massachusetts College of Pharmacy, and aims to present in a concise manner the more important chemical, microchemical and microscopic methods now in general use in the examination of the urine. No attempt is made to dwell on theoretical or diagnostic points in connection with such examinations, the author rightly pointing out that it is not the office of the analyst or the technician to make the diagnosis. The methods outlined are the generally accepted ones for this work, and the discussions are clear and concise. The book is divided into nineteen chapters dealing with the various phases of the examination of the urine. Of especial value to the student should be the chapter on condensed laboratory directions for chemical examination, as from this he may gain much information of a practical nature. The book can be recommended to all nonmedical workers who may wish to become familiar with urine examination, and also to the general medical student as a guide to the practical, routine study of the renal excretion.

PATHOLOGICAL TECHNIQUE. A Practical Manual for Workers in Pathological Histology and Bacteriology including Directions for the Performance of Autopsies and for Clinical Diagnosis by Laboratory Methods. By Frank Burr Mallory, A.M., M.D., Pathologist to the Boston City Hospital, and James Homer Wright, A.M., M.D., S.D., Pathologist to the Massachusetts General Hospital. Eighth edition. Cloth. Price, $6.50. Pp. 666, with 180 illustrations. Philadelphia: W. B. Saunders Company, 1924.

The first part of this book is devoted to the technic for cutting, fixing, embedding and staining specimens. That portion on staining solutions gives many differential stains. The portion of the book on culture mediums and culture methods includes the hydrogen ion concentration method of adjusting mediums as well as the titration method, and the culture and differentiation of pathogenic bacteria and fungi. The next chapter is on animal parasites. The chapter on blood includes, besides the usual examinations, such special examinations as the percentage volume of the red corpuscles, the volume of the blood, the volume index, the resistance of

red corpuscles, and the technic for determining the incompatibility of blood for transfusion. The chapter on serologic technic comprises the Widal test, the Wassermann reaction and other complement fixation tests, the precipitation tests for syphilis, the examination of cerebrospinal fluid, and the examination of sputum. The last chapter concerns postmortem examinations. In an addendum is a method of preparing bacterial vaccines and taking photographs and photomicrographs of specimens. Copyrighted in 1897 and now in its eighth edition, this book indicates to a great extent the progress in pathologic technic. The chapter on the blood has been rewritten and gives now not only the technic of examination, but also the clinical interpretation of results. Among other sections that have been rewritten are those on pigments, fats and lipoids, and museum preparations.

PRACTICAL CHEMICAL ANALYSIS OF BLOOD. A Book Designed as a Brief Survey of This Subject for Physicians and Laboratory Workers. By Victor Caryl Myers, M.A., Ph.D., Professor and Director of the Department of Biochemistry, New York Post-Graduate Medical School and Hospital. Second edition. Cloth. Price, $5. Pp. 232, with 33 illustrations. St. Louis: C. V. Mosby Company, 1924.

Systematic analysis of the blood as an aid to diagnosis has been developed largely within the last decade. The newer methods have yielded especially helpful information in diabetes, nephritis and gout, while the data obtained in renal diabetes, tetany, rickets, diarrheal acidosis, eclampsia, pneumonia, cholelithiasis and many other pathologic conditions have given us new points of view for many of these disorders. This book aims to describe the chemical methods of blood analysis that have been found to be of definite value in diagnosis and treatment of disease. Generally only a single method is given for each constituent, as the methods described are especially suited to the author's scheme of analysis. However, the methods of the Folin-Wu system of blood analysis are given completely in a separate chapter. Most blood examinations required may be made on from 10 to 20 c.c. of blood. In the Folin-Wu system, which requires only 10 c.c., Myers points out that with this small amount of material there may be conditions in which the use of the system can scarcely be considered an advantage.

INSANITY AND LAW. A Treatise on Forensic Psychiatry. By H. Douglas Singer, M.D., M.R.C.P., Professor of Psychiatry, University of Illinois College of Medicine, and William O. Krohn, A.M., M.D., Ph.D. Cloth. Price, $6. Pp. 437. Philadelphia: P. Blakiston's Son & Co., 1924.

This is a concise statement of the basic facts and theories underlying current medical concepts of mental disorders, and of the related principles of law. A glossary is appended to smooth the way of the uninitiated over the difficulties of medical and legal terminology. A chapter on "Needed Reforms" follows the usual formula of deterministic psychology; the delinquent is not to be punished, but to be subjected to regimen adjusted by experts to his particular needs, for the purpose of curing or counteracting the antisocial flaws in his personality. The nonmedical reader may find the discussion of the medical and psychologic aspects of mental disorders difficult reading, but the book is nevertheless one that can be commended to lawyers and physicians alike when in need of tabloid information on the subjects it covers. To the physician still a novice on the witness stand and the lawyer not yet adept in the art of examining medical witnesses, the chapter on the physician in court will prove particularly helpful.

CANCER RESEARCH AT THE MIDDLESEX HOSPITAL, 1900-1924. Retrospect and Prospect. Compiled by Members of the Staff of the Hospital and Medical School and Issued by Authority of the Cancer and General Research Committee. Edited by W. Sampson Handley, M.S., F.R.C.S. Cloth. Price, 3 shillings, 6 pence net. London: John Murray, 1924.

This is a compilation setting forth in compact form the summation of the work done in cancer at the Middlesex Hospital, long famous for its work in this field, with the unique record of having conducted cancer research since the year 1792. The record as set forth in this small volume is an impressive one. The only criticism to be made is that in presenting the work of this institution in abstract, the impression is occasionally given that the results here recorded are final, whereas, in some instances at least, they have not been confirmed by other investigators.

Medicolegal

Neither Family Physician nor Surgeon Liable

(Mayer v. Hipke et al. (Wis.), 197 N. W. R. 333)

The Supreme Court of Wisconsin, in reversing a judgment, which was for $2,000, against a family physician and for $8,000 against an operating surgeon, and in directing that the complaint be dismissed, says that, in August, 1920, the family physician of Mrs. Mayer, becoming convinced that an operation was necessary, advised her removal to a hospital and called a surgeon into the case, who removed her right kidney, which was found to be infected. No entry was made into the abdominal cavity. The wound closed at both ends, but not in the center until about the last of June, 1921, after which it opened again, discharging considerable pus, and the surgeon performed a second operation, establishing drainage. Later, a third operation was performed and a rib resected to relieve a pus condition in the pleural cavity. The patient died in November, 1921. Her husband testified that during the last five days of her life particles of food were at times noticed on the dressing at the wound, and that about two days before her death a gauze pack about 7 or 8 inches long, in the form of a roll about 1½ inches in diameter, was removed from the wound. The jury found that the gauze pack was left in the abdomen of Mrs. Mayer by the surgeon when the operation was performed in August, 1920, and that he failed to exercise ordinary care, which was the proximate cause of Mrs. Mayer's death; that the family physician had also failed to exercise ordinary care at the operation, as also in diagnosis and treatment, which failures were proximate causes of the death. But it also appeared in evidence that the patient had in 1917 undergone an operation for appendicitis by some surgeon whose name did not appear in the record. As to the family physician, the record disclosed no evidence on which a failure to exercise reasonable care could be predicated. He was present in the operating room as family physician, did what he was told to do, and outside of that had no duties to perform. It was contended that it was his duty to instruct the nurses to count the sponges and to direct the operation, but there was no evidence to that effect. Standards of duty for a family physician attending an operation under circumstances appearing in this case cannot be established by argument or assertion. What constitutes ordinary care in a case such as this is to be determined by the testimony of those who know what it is, not as a matter of common knowledge. Nor was there any evidence of any failure on the part of the operating surgeon to exercise due care. The testimony left the question of whether or not the pack was introduced in 1920, or at the time of the appendical operation in 1917 in grave doubt, while the burden was on the plaintiff to satisfy the jury to a reasonable certainty that the pack was left in the body of the patient by the defendant surgeon who operated in 1920. It was not sufficient for the evidence to raise a suspicion or to indicate a possibility. It must be sufficient to remove the controverted question from the field of doubt and speculation into that of reasonable certainty. There was no evidence to show that it was the duty of the surgeon to explore an unopened abdomen in search of a supposititious foreign body. The testimony was the other way.

Legal Duty of Natural Relatives of Insane Persons

(State ex rel. Seaver v. Wilson et al. (Okla.), 222 Pac. R. 567)

The Supreme Court of Oklahoma says it is well settled that at common law the duty of natural relatives of an insane person is of imperfect obligation only, and cannot be enforced. The ties of consanguinity prompt, or should prompt, relatives who are able in the care and keep of the indigent insane. In the absence of a statute, there is no obligation on a relative to maintain such a person. What relative, if any, should be made liable in such case is a matter solely of legislative cognizance. There is no statutory authority in Oklahoma to compel the brothers of an adult, indigent, insane person to reimburse the state for expenses paid or to be paid in keeping such person as a public patient in a hospital for the insane.

Wherefore in this case, in which it was sought to require the brothers of an adult, indigent, insane person to reimburse the state for the expenses incurred in his care in the state hospital for the insane, a judgment in favor of the defendants is affirmed, and this notwithstanding that the man was committed to the hospital on the petition of one of the defendants, in whose home he had been cared for, temporarily, pending such commitment.

Rules Recognized—Case for Jury—Second Operation

(Howatt v. Cartwright (Wash.), 222 Pac. R. 496)

The Supreme Court of Washington, in affirming a judgment in favor of the plaintiff, says that she received a fracture of the left femur, near the hip, and was taken to a hospital operated by the defendant. There a roentgenogram was taken, and the following day the fluoroscope was used and the limb placed in a Thomas splint. The defendant testified that his examination disclosed a comminuted impacted fracture, and that he proceeded to use such methods as are known to surgery for the treatment of an impacted fracture. At the end of ten days, finding that the Thomas splint was occasioning trouble, he removed the splint and substituted a straight extension. This proving unsatisfactory, an angle box was used. The roentgen ray and the fluoroscope were never again made use of, but the limb was measured every day for three weeks in order to compare it with the right one. After remaining in the hospital for some time, the plaintiff was released with the left leg some three-quarters of an inch shorter than the right one, and with the left foot having an outward rotation of 80 degrees.

This court recognizes the rule, laid down so often, that a surgeon is not liable merely because of a bad result. And that he is not responsible in damages in a malpractice suit if the treatment which he employs is that which is recognized and approved by those reasonably skilled in his profession, practicing in the same neighborhood and in the same line of practice, and if he administers that treatment with a degree of skill and diligence as such practitioners ordinarily exercise in like cases. This court also recognizes that it is not a question of fact for the jury, but the court will determine that there is nothing on which the jury may pass, where reputable physicians and surgeons of equal skill and learning disagree in their opinion as to what the proper treatment should have been, and that the jury will not be allowed to accept one theory to the exclusion of the other. It is enough if the treatment actually employed had the approval of at least a respectable minority of the medical profession and is recognized by such as a proper method. The defendant contended that, applying these rules to the facts here, the case should have been taken from the jury and judgment rendered for him. But difficulty in arriving at this conclusion arose from the fact that there was a dispute here as to the nature of the fracture. The negligence on which the plantiff relied to sustain the judgment which she recovered was that the defendant failed to use sufficiently often the roentgen rays and the fluoroscope, and that had he resorted to these aids he would have discovered the conditions which led to the ultimate unsatisfactory results. She conceded that the failure to use these aids was not negligence if the fracture was an impacted one. The testimony was conflicting as to whether the fracture was an impacted one or an unimpacted one, and, with this conflicting testimony as to the nature of the fracture which was treated, the court could not apply the rules to which reference has been made, and take the case from the jury.

There was another circumstance which was of weight and which the jury had a right to take into consideration, and that was that a second operation was found necessary to cure the situation resulting from the operation by the defendant.

Accident and Occupational Disease—Diseases Attributable to Accident

(Peru Plow & Wheel Co. v. Industrial Commission et al. (Ill.), 142 N. E. R. 546)

The Supreme Court of Illinois holds that where an employee was disabled by an inflammation of the lungs which was probably caused by his continued breathing of iron dust in his occupation, his disability was a disease of his occupation, and it was error to make an award under the workmen's compensation act of the state as for an accidental injury. The court says that it is its view that the word "accident" is not a technical legal term. No legal definition has been given or can be given which is both exact and comprehensive as applied to all circumstances. Those things which happen without design are commonly called an accident—at least in the popular acceptation of the word. Any event unforeseen, not expected by the person to whom it happened, is included in the term. An occupational disease is a disease condition arising gradually from the character of the work in which the employee is engaged. It does not occur suddenly, but is a matter of slow development. An occupational disease is not an accident. An accident, as distinguished from an occupational disease, as the former is contemplated under the compensation law of Illinois, which does not cover occupational diseases, arises by some definite event, the date of which can be fixed with certainty, but which cannot be so fixed in the case of occupational diseases. In this case there was not one circumstance, incident or time that could be pointed to as the starting place of the employee's disability, and the court is forced to the conclusion that the disability did not arise out of an accidental injury.

But not every disease is occupational simply because the conditions that were the immediate cause of the injury obtained for a long period of time. Certain diseases are well recognized as being attributable to accident, such as those caused by the entering of a disease germ through breaking of the skin, as anthrax. Actinomycosis, a disease caused by handling wheat and barley, has been held to be an accidental injury; also, disability caused from inhaling poisonous fumes in attempting to put out a fire; paralysis, caused by exertion of a traveling salesman in running to catch a train while carrying heavy hand luggage; nephritis, caused by exposure of the employee after working in heat and steam; eczema, caused by exposure to fumes and splashes of carbon bisulphid; rheumatism and gangrene, following an injury caused by dropping a heavy weight on the foot. On the other hand, it has been held that illness caused to a seaman by general exposure to rough weather could not be held to be an injury by accident, and that the death of a stoker following a gradual collapse from exhaustion induced by work for several days in the tropical heat of the Red Sea was not death by accident.

The rule recognized in Illinois is that, in order that the disability be by reason of an accidental injury or the result of an accident, it must be traceable to a definite time and place of origin. There must be some definite thing happen which can be pointed to as the immediate cause of the breakdown, although the employee may have been able to work in similar conditions for a considerable period of time prior to the happening of the event which was the immediate cause of his breakdown.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Montreal, Canada, Sept. 15-20. Dr. Luther C. Peter, 1529 Spruce Street, Philadelphia, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Sept. 18-20. Dr. James E. Davis, 111 Josephine Avenue, Detroit, Secretary.

American Electrotherapeutic Association, New York, Sept. 9-12. Dr. Richard Kovacs, 223 E. 68th Street, New York, Secretary.

Colorado State Medical Society, Denver, Oct. 7-9. Dr. F. B. Stephenson, Metropolitan Building, Denver, Secretary.

Indiana State Medical Association, Indianapolis, Sept. 24-26. Dr. Charles N. Combs, 221 South 6th Street, Terre Haute, Secretary.

Kentucky State Medical Association, Louisville, Sept. 23-25. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Minnesota State Medical Association, St. Cloud, Oct. 8-10. Dr. Carl B. Drake, Guardian Life Building, St. Paul, Secretary.

Missouri Valley, Medical Society of the, Des Moines, Sept. 17-19. Dr. Charles W. Fassett, 115 E. 31st Street, Kansas City, Mo., Secretary.

North Dakota State Medical Association, Bismarck, Sept. 10-11. Dr. H. J. Rowe, 5211 Upton Avenue, S., Minneapolis, Minn., Secretary.

Pennsylvania, Medical Society of the State of, Reading, Oct. 6-9. Dr. W. F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.

Vermont State Medical Society, Burlington, Oct. 9-10. Dr. W. G. Ricker, St. Johnsbury, Secretary.

Wisconsin, State Medical Society of, Green Bay, Aug. 20-22. Mr. J. G. Crownhart, 588 Jefferson Street, Milwaukee, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

Atlantic Medical Journal, Harrisburg, Pa.

27: 619-690 (July) 1924

Practical Points in Pelvic Surgery. T. S. Cullen, Baltimore.—p. 619.
Preservation of Ovaries in Pelvic Surgery. B. M. Anspach, Philadelphia.—p. 625.
Present Status of Minor Surgical Procedures in Gynecology. R. R. Huggins, Pittsburgh.—p. 631.
Surgical Reconstruction of Nose. J. W. Bransfield, Philadelphia.—p. 637.
Recurrent Hemorrhage into Retina and Vitreous of Young Persons. L. G. Redding, Scranton, Pa.—p. 640.
Acute Otitis Media and Mastoid Involvement. J. I. McLallen, Pittsburgh.—p. 643.
Management of Ureteral Calculi. W. H. Haines, Philadelphia.—p. 646.
*Rupture of Rectum from Instrumentation. C. G. Brumbaugh, Huntingdon, Pa.—p. 651.
General Practitioner and Specialist. F. A. Rupp, Lewistown, Pa.—p. 652.

Rupture of Rectum by Sigmoidoscope.—Brumbaugh's patient sustained a rupture of the rectum from the introduction of a sigmoidoscope by an osteopath. Peritonitis developed and the patient's condition became serious. The treatment was expectant and supportive. A few days later there was a slight bloody, purulent vaginal discharge with a distinct colon odor, a small fecal stool and periodic oozing of pus and blood from the anus. One finger carefully introduced into the rectum encountered an indurated pitted area about 3½ inches up on the anterior wall with the retroverted fundus in apposition to it. A diagnosis of recto-uterine fistula with right-sided salpingitis was made. The patient recovered in about four weeks. In Brumbaugh's opinion, the introduction of a full-length sigmoidoscope is a major diagnostic procedure, and to be classed with cystoscopy and ureteral catheterization from the element of risk to the patient. Its use should be restricted to those who have sufficient experience to recognize the significance of pelvic adhesions, and the skill necessary to effect its passage by gentle manipulation rather than force. It is certainly questionable if sigmoidoscopy comes within the legal limits of osteopathic practice.

Boston Medical and Surgical Journal

190: 1103-1148 (June 26) 1924

*Postoperative Massive Collapse of Lungs. C. C. Lund and M. Ritvo, Boston.—p. 1103.
*Acute Abscess of Lung Complicated by Massive Collapse of Lung. H. Elwyn, New York.—p. 1108.
Five Cases of Brain Tumor. W. B. Terhune, New Haven, Conn., and A. F. Riggs, Stockbridge, Mass.—p. 1121.
Effect of Radium on Glaucoma. J. J. Corbett, Boston.—p. 1124.

Postoperative Collapse of Lungs.—Lund and Ritvo advise that gross displacement of the heart should be looked for in all postoperative and post-traumatic pulmonary complications. If it is present, with the displacement toward a side of the chest with an area of dulness or flatness, it means massive collapse of the lungs. All postoperative pulmonary cases in which the diagnosis is doubtful should be studied by the roentgen ray. This can be done with a portable machine without danger or discomfort to the patient. Recognition of these cases is important on account of the relatively good prognosis under conservative treatment and of the serious consequences which may come if the patient is tapped or pleura explored under a mistaken diagnosis.

Acute Abscess of Lung with Massive Collapse.—The case reported by Elwyn represents the unusual picture of an acute abscess in the right lower lobe complicated by a massive collapse of the entire right lung. The cause of the abscess could not be determined. Two days before the onset of his symptoms the patient had been swimming. It is possible that while swimming he aspirated some water into the right lung which was responsible for an aspiration pneumonia, resulting nine days later in an abscess.

191: 1-42 (July 3) 1924

*Lymphatic Leukemia; Irradiation. G. B. Minot and R. Isaacs, Boston.—p. 1.
Radiation Therapy of Thyroid and Ductless Glands. G. W. Holmes, Boston.—p. 10.
Roentgen Ray and Radium in Treatment of Nonmalignant Diseases of Uterus. L. B. Morrison, Boston.—p. 13.
Radium in Treatment of Nonmalignant Diseases of Skin. F. S. Burns, Boston.—p. 16.
Roentgen Ray and Radium in Nonmalignant Diseases of Eye. G. S. Derby, Boston.—p. 20.

Irradiation for Lymphatic Leukemia.—Data are presented by Minot and Isaacs concerning ninety-eight cases of chronic lymphatic leukemia and fifty-seven of the acute form of the disease. End-results have been studied especially from eighty cases of the chronic form in patients over 30 years of age; fifty treated by intensive irradiation with radium or roentgen rays, and thirty that were not. The latter serve as a control group to the former. Irradiation had no detectable effect on prolonging the duration of either form of the disease. Irradiation, properly administered, undoubtedly benefits symptomatically cases of the chronic form though not to the extent that occurs in chronic myelogenous leukemia. Moderate or greater general improvement, after the first course of irradiation, occurred in 47 per cent. of sixty-one cases, rather slight improvement in 30 per cent. and no improvement in 23 per cent. The efficiency of 10 per cent. was increased strikingly. The chances of improvement are in fairly direct relationship with the time before death that treatment is given. The beneficial effects of irradiation in acute lymphatic leukemia are but evanescent and slight. Irradiation may induce a better production of the three formed elements of the marrow and lessen the activity of the formation of lymphocyte cells. Irradiation usually causes little or no improvement of the patient when the hemoglobin is 50 per cent. or less, or when outstanding purpura with thrombopenia is present, or when there are many immature and atypical lymphocytes in the peripheral blood. The effect of irradiation on decreasing the size of lymph nodes or spleen in chronic lymphatic leukemia is apt to be proportional to the amount of improvement in the patient's general sense of well being. Treatment should be guided and prognosis formulated from correlated information obtained from the patient's history and physical signs, together with complete blood examinations and basal metabolic rate determinations.

California and Western Medicine, San Francisco

22: 307-364 (July) 1924

Clinical Diagnosis of Syphilis. E. D. Chipman, San Francisco.—p. 307.
Acute Epidemic Encephalitis. J. W. Shuman.—p. 311.
*Postoperative Care of Laparotomies. C. G. Wilson, Palo Alto, Calif.—p. 315.
Hay-Fever in Sonoran Belt of Intermountain District. H. J. Templeton, Hiawatha, Utah.—p. 317.
Present Status of Treatment of Diabetes with Insulin. W. D. Sansum and others, Santa Barbara, Calif.—p. 321.
Treatment of External Cancers. A. Davidson, Los Angeles.—p. 324.
Surgical Prostate. L. C. Jacobs, San Francisco.—p. 326.
History of Anesthesia in California. R. F. Hastreiter, Los Angeles.—p. 329.

Postoperative Care of Laparotomies.—Wilson applies a 10 per cent. hot magnesium sulphate stupe over the abdomen following a laparotomy. From four to six layers of flannel, at a temperature of 105 to 110 F., are laid over the entire abdomen and sealed wound; these stupes are kept hot with hot water bag or electric pad and are changed every hour.

Journal of Bone and Joint Surgery, Boston

6: 503-754 (July) 1924

Arthritis. L. T. Swaim, Boston.—p. 510.
Treatment of Tuberculosis of Bones and Joints. G. R. Girdlestone, Oxford, England.—p. 519.
Compression Paraplegia and Pott's Disease. C. Wallace, New York.—p. 538.
Case of Multiple Bone Lesions. C. L. Brown and D. M. Stiefel, Boston.—p. 550.
Perirenal Abscess in Children. W. G. Elmer, Philadelphia.—p. 564.
Radius Curvus (Madelung's Wrist): Two Cases. B. H. Moore, Chicago.—p. 568.
*Habitual Dislocation of Patella. W. E. Gallie and A. B. Lemesurier, Toronto.—p. 575.
Case of Congenital Defect of Pectoral Muscles. C. B. Bennett, Berkeley, Calif.—p. 583.

Treatment of Congenital Dislocation of Hip. Z. B. Adams, Boston.—p. 586.
*Congenital Absence of Radius. K. Kato, Los Angeles.—p. 589.
Surgical Treatment of Infantile Paralysis of Lower Extremity. J. E. M. Thomson, Lincoln, Neb.—p. 627.
*Surgical Correction of Plantar and Adduction Contraction of Foot Arch. J. T. Rugh, Philadelphia.—p. 664.
Periarterial Sympathectomy. A. Krida, New York.—p. 675.
Fracture of Femur. J. C. Wilson, Hartford, Conn.—p. 680.
Correction of Burn Scar Deformty by Z-Plaste Method. S. L. McCurdy, Pittsburgh.—p. 683.
*Correction of Paralytic Genu Recurvatum. C. H. Heyman, Cleveland.—p. 689.
Fracture of Lesser Trochanter. I. Balensweig, New York.—p. 696.
Apparatus for Preventing Toe-Drop. B. B. Nicholson, University, Va.—p. 704.
*Clasp for Retaining Extension Straps. G. T. Tyler, Jr., Greenville, S. C.—p. 706.

Habitual Dislocation of Patella.—The operation employed by Gallie and Lemesurier consists in tethering the patella itself by a strand of tendon or fascia to the internal condyle of the femur at the point which forms the center of the circle through the arc of which the patella moves on flexion and extension of the knee. The technic of the operation varies with the force that is required to hold the patella in place. Occasionally the force necessary is very great and in such conditions the authors use a thick piece of the Achilles tendon.

Congenital Absence of Radius.—Two hundred and fifty cases recorded in medical literature up to 1923 are reviewed and tabulated by Kato and three new cases are reported.

Correction of Plantar Contraction of Foot Arch.—Rugh does a modified Phelps operation. A pedicled flap of skin, fat and fascia is transplanted from the calf of the opposite leg. The purpose of the transplant is the interruption of the continuity of tissues which are pathologic and which constantly tend to shorten as a result of the inherent changes arising from the underlying causative factors.

Correction of Paralytic Genu Recurvatum.—Heyman makes use of a modification of the Edwards operation for reconstruction of the lateral ligaments. Whereas the Edwards operation aims to construct bands with attachments at the normal sites of attachment of the lateral ligaments, the modification proposed consists of securing the femoral attachment as far posterior on the femoral condyles as possible, and on the medial side to obtain an anterior attachment on the tibia.

Clasp for Retaining Extension Straps.—One of the difficulties attending the use of extension straps when applied to the leg is the pulling away of the straps just above the ankle. To overcome this difficulty, Tyler has devised a "wish-bone" clasp with movable blades attached to hold the lateral straps against the skin immediately above the malleoli. Since no important vessels or nerves lie along the bones in this region, injury is not likely. Pressure can be controlled and adjustment easily made at the joint of the clasp, giving pressure only sufficient to overcome the pulling away by the weights.

Journal of Laboratory and Clinical Medicine, St. Louis

9: 663-732 (July) 1924

*Significance of Glycosuria. P. L. Marsh, Ann Arbor, Mich.—p. 663.
Preserving Specimens of Blood. W. Denis and J. L. Beven, New Orleans.—p. 674.
*Calcium Content of Blood in Pathologic Conditions. I. Koechig, St. Louis.—p. 679.
*Pharmacology of Benzyl Alcohol and Its Esters. III. Effect of Benzyl-Benzoate on Arterial Hypertension in Man. C. M. Gruber and H. H. Shackelford, St. Louis.—p. 685.
Bacteriologic Study of Extirpated Tonsils. L. A. Julianelle, Philadelphia.—p. 699.
Excretion of Creatinin in Uranium Nephritis. R. H. Major, Kansas City, Kan.—p. 701.
Comparison of Wassermann and Precipitation Reactions in Various Stages of Syphilis. M. A. Wilson and R. M. Nedley, New York.—p. 704.
Clinical Syphilis and "Standard Wassermann (Kolmer's)." W. F. Lorenz and W. J. Bleckwenn, Madison.—p. 709.
Gram-Staining Properties of Treponema Pallidum. D. Wilkes-Weiss, Philadelphia.—p. 716.
Blood-Counting Pipet. C. Reich, New York.—p. 718.
Paraffin Section Method. R. T. Hance, Philadelphia.—p. 719.
Hydrogen Electrode Technic. J. P. Baumberger, Stanford University, Calif.—p. 720.
Apparatus for Determination of Urea by Urease Method. A. A. Horvath, Peking, China.—p. 722.
Counting Rapid Rhythmic Movement. J. P. Baumberger, Stanford University.—p. 723.

Significance of Glycosuria.—Marsh summarizes his paper as follows: Any glycosuria should be considered diabetic until clearly proved otherwise. On the other hand, it must not be forgotten that there are a number of other syndromes in which glycosuria is a symptom. Emphasis is placed on the importance of maintaining the diabetic in a sugar-free state, even if his case be very mild or very severe, whether dietetic treatment alone be used, or insulin be used as an aid to diatetic treatment.

Blood Calcium in Disease.—A decrease of calcium was observed by Koechig in a case of nephritis with uremia (8.6 mg.), while milder renal, cardiorenal, and cardiac cases showed little decrease. A case of dysentery and chronic colitis showed a slight decrease (9.3 mg.) in the calcium content of the plasma possibly due to an increased excretion of calcium into the large intestine. A single case each of pellagra (8.8 mg.) and of osteomalacia (7.4 mg.) showed a distinct decrease in plasma calcium as did also a case of adult tetany (8.1 mg.). Only three cases showed an increase of the calcium content of the plasma, two of these being Paget's disease (11.8 and 12.1 mg.) and the third a pathologic fracture in which the roentgen-ray findings showed a destruction of the bone (11.8 mg.). After intravenous injections of calcium chlorid in a patient with adult tetany, the calcium content of the plasma rose and then returned to normal within one hour. It would appear, therefore, that calcium injection is not very effective in producing and maintaining an increased amount of plasma calcium. The low content associated with tetany is doubtless due to factors other than a mere insufficient supply.

Effect of Benzyl Benzoate on Blood Pressure.—According to Gruber and Shackelford, benzyl benzoate taken in 25 or 30 drop doses (20 per cent. in alcoholic solution) has no immediate depressant effect on blood pressure. Benzyl benzoate taken in 30 drop doses, four times a day, for from four to eighteen days, has no effect on the blood pressure in patients suffering with hypertension. The authors believe that benzyl benzoate has no action on the blood vessels when taken by mouth and that it should have no place in the physician's armamentarium in the treatment of the above condition.

Kansas Medical Society Journal, Topeka

24: 189-218 (July) 1924

Justice for Streptococcus. M. L. Bishoff, Topeka.—p. 189.
Application of Chlorid Determination in Well Water. E. G. Brown, J. G. Wahlin and G. W. Hill, Topeka.—p. 191.

Kentucky Medical Journal, Bowling Green

22: 213-274 (July) 1924

Treatment of Diphtheria of Larynx. S. S. Watkins, Louisville.—p. 216.
Pyrexias of Obscure Origin in Children. P. F. Barbour, Louisville.—p. 218.
Surgery of Spleen. C. A. Vance, Lexington.—p. 222.
Treatment of Ununited Fractures. J. M. Salmon, Ashland.—p. 226.
Disease of Colon. C. W. Dowden, Louisville.—p. 228.
Gallstone Ileus. F. W. Rankin and A. M. McKeithen, Louisville.—p. 236.
Endogenous Uric Acid in Conditions Other Than Gout and Nephritis. J. D. Allen, Louisville.—p. 240.
Surgery of Prostate. O. Grant, Louisville.—p. 242.
Chronic Infectious Arthritis. O. R. Miller, Louisville.—p. 248.
Purpura Hemorrhagica: Splenectomy. M. Flexner, Louisville.—p. 252.
Uterine Fibroma Weighing Forty-Seven Pounds. M. Y. Marshall, Henderson.—p. 253.
Life and Work of Edward Jenner. S. Graves, Louisville.—p. 254.
Perforating Injuries of Eyeball. R. W. Bledsoe, Covington.—p. 257.
Glioma of Retina in Child Aged Two. A. Pfingst, Louisville.—p. 259.
Pregnancy Complicated by Uterine Fibroma: Postoperative Intussesception: Nephritis: Uremia: Fatality. L. W. Frank, Louisville.—p. 260.
Endocrinology in Gynecology and Obstetrics. S. D. Breckinridge, Lexington.—p. 261.
Radiation in Benign Affection of Uterus: Cases. D. Y. and J. P. Keith, Louisville.—p. 264.

Michigan State Medical Society Journal, Grand Rapids

23: 279-322 (July) 1924

Retrobulbar and Intra-Ocular Neuritis Due to Hyperplastic Changes in Ethmosphenoid Sinuses. J. M. Sutherland, Detroit.—p. 279.
Osteomyelitis. L. Dretzka, Detroit.—p. 291.
Automobile Battery Burns of Eyes. M. C. Loree, Lansing.—p. 292.
Carcinoma of Large Intestine. C. D. Brooks, Detroit.—p. 294.
Traumatic Neuroses; Relation to Surgeon. R. H. Denham and F. P. Currier, Grand Rapids.—p. 299.
Giardia Intestinalis: Four Cases. J. R. Jeffrey, Battle Creek.—p. 303.

New Orleans Medical and Surgical Journal

77: 1-62 (July) 1924

Practice in Central Africa. R. R. King, Mutoto, Congo Belge, Africa.—p. 1.
Pneumonia in General Practice. S. B. Wolff, Opelousas, La.—p. 5.
Monilia Pulmonalis in Fresh Sputum. F. M. Johns, New Orleans.—p. 8.
Therapeutic Application of Roentgen Rays. H. G. F. Edwards, Lafayette, La.—p. 11.
Malaria in Louisiana. M. A. Barber, Crowley, La.—p. 16.
Extra-Uterine Pregnancy. O. P. Daly, Lafayette, La.—p. 20.
Syphilis of Stomach: Cases. D. L. Kerlin and W. B. Rawls, Shreveport, La.—p. 25.
*New Anesthetic Gas. J. T. Halsey, C. Reynolds and H. B. Cook, New Orleans.—p. 29.
Oral Diganosis. H. W. Guthrie, New Orleans.—p. 30.
Provisional Prostheses and Early Weight Bearing in Amputations of Lower Extremities. H. T. Simon, New Orleans.—p. 35.

Propylene Anesthesia.—Halsey and his associates describe their experiments with propylene which is said to be about three times as powerful an anesthetic as is ethylene. There are grounds for believing this gas, while composed mainly of propylene, contains other substances. Therefore, it is possible that its anesthetic powers are due to these contaminations. Even with this impure gas the margin of safety seems to be sufficiently wide. The poorest lot of gas prepared shows a margin of over 60 per cent., the best lot one of over 115 per cent. Biologic tests and physical and chemical theory show extraordinarily accurate agreement, and it is believed that more numerous experiments on animals will soon justify testing out this gas on human beings.

New York State Journal of Medicine, New York

24: 751-786 (July) 1924

Present Status of Investigations with Tryparsamide. L. Pearce and W. H. Brown, New York.—p. 751.
Intracutaneous Diphtheria Toxin Test. B. Schick, New York.—p. 756.
Management of Nervous Patient. E. L. Hanes, Rochester.—p. 759.
Nervous Patient. E. B. Angell, Rochester.—p. 762.

Ohio State Medical Journal, Columbus

20: 417-480 (July) 1924

*Differential Diagnosis of Hyperthyroidism. O. P. Kimball, Cleveland.—p. 421.
Posterior Occipital Presentations, Eclampsia and Placenta Praevia. G. Fitz-Patrick, Chicago.—p. 425.
Relation of Efficient Laboratory Service to Proper Care of Patient. A. A. Eisenberg, Cleveland.—p. 428.
Treatment of Fracture of Olecranon Process by Hay Hook Tractor. K. Hale, Wilmington.—p. 434.
Rôle of Toxemias in Affections of Eye. J. W. Wright, Columbus.—p. 435.
Acid-Fast Factors in Control of Tuberculosis. H. L. Rockwood, Cleveland.—p. 436.

Hyperthyroidism.—Of the eighty-four cases studied by Kimball, twenty-four were found to be extremely sensitive to iodin, i. e., small daily doses of iodin (10 mg. is sufficient) intensified every symptom of hyperthyroidism and the basal metabolism rate was increased. In each of these twenty-four cases operation was advised and eighteen of these patients were operated on. In each of these eighteen cases, immediate and striking results were obtained. These patients have been followed for months and in every case the results have been permanent and most gratifying. Of the six who refused operation, three have been followed closely and various methods of medical treatment have been applied. No one of these three patients has shown any permanent improvement. Among the sixty cases in which the functional test was negative, that is, who were not sensitive to iodin, nineteen were operated on. The postoperative course of these nineteen patients presents a marked contrast to that of the patients who were sensitive to iodin. In no one of these nineteen cases did any definite, satisfactory result follow the thyroidectomy. The remaining forty-one cases were treated according to the findings.

Oklahoma State Medical Association Journal, Muskogee

17: 169-190 (July) 1924

Goiter; Calcium Metabolism. C. W. Heitzman, Muskogee.—p. 169.
Focal Infection as Cause of Urinary Diseases in Women. F. M. Sanger, Oklahoma City.—p. 174.
Sacro-Iliac Strain. J. C. Johnston, McAlester.—p. 176.
Gonorrheal Rashes. J. S. Hooper, Tulsa.—p. 177.
Internal Ear in Diagnosis. A. C. McFarling, Shawnee.—p. 178.

Public Health Journal, Toronto

15: 241-289 (June) 1924

Review of Recent Work on Diphtheria. J. G. Fitzgerald.—p. 241.
Relative Value of Sex Education. J. J. Heagerty.—p. 258.
Smallpox Epidemic in Windsor. R. R. McClenahan.—p. 263.

Radiology, St. Paul

3: 1-90 (July) 1924

Roentgenology of Urinary Tract. B. H. Nichols, Cleveland.—p. 1.
Therapeutic Radiation from Surgeon's Standpoint. L. L. McArthur, Chicago.—p. 7.
Obstetric Roentgenography. W. A. N. Dorland, Chicago.—p. 10.
Chronic Pulmonary Streptococcicosis. F. S. Bissell, Minneapolis.—p. 20.
Short Wave Roentgen Rays in Other Than Deep Conditions. A. Soiland and W. E. Costolow, Los Angels.—p. 23.
Roentgenologic Diagnosis of Diaphragmatic Hernia: Seventeen Cases. R. D. Carman and S. Fineman, Rochester, Minn.—p. 26.
Table for Fluoroscopic Examination of Fractures. L. R. Sante, St. Louis.—p. 46.
Light-Proof Film Cabinet. E. Schons, St. Paul.—p. 48.
Gross Pathology of Chest. W. W. Wasson, Denver.—p. 49.
Shadows in Aortic and Hilar Regions. A. Granger, New Orleans.—p. 55.
Human Cancer in Relation to Heredity. H. G. Wells, Chicago.—p. 60.
Shadows of Calcified Areas in Bony Pelvis. C. G. Sutherland, Rochester, Minn.—p. 69.
Postoperative Roentgen-Ray Examination in Dentistry. B. S. Gardner, Rochester, Minn.—p. 74.

Rhode Island Medical Journal, Providence

7: 97-112 (July) 1924

Digitalis in Heart Disease. F. T. Fulton, Providence.—p. 97.

Southern Medical Journal, Birmingham, Ala.

17: 461-548 (July) 1924

Creatinin Test for Renal Function. R. H. Major, Kansas City, Mo.—p. 461.
*Symptoms of Achylia Gastrica. B. W. Fontaine, Memphis, Tenn.—p. 466.
Spirochetosis Bronchialis: Case Report. A. E. Greer, Houston, Tex.—p. 469.
*Tuberculosis in Infants. O. M. Schloss, New York.—p. 474.
*Tetany in Breast-Fed Baby: Increase in Convulsions After Saline Hypodermoclysis. C. E. Conrad, Harrisonburg, Va.—p. 477.
*Multiple Myeloma: Two Cases. J. W. Scott, Lexington, Ky.—p. 478.
Hair Growth. T. W. Murrell, Richmond, Va.—p. 485.
Diphtheria Control. C. C. Hudson, Richmond, Va.—p. 489.
Control of Hookworm Disease in South Alabama. W. G. Smillie, Andalusia, Ala.—p. 494.
Intra-Ureteral Manipulations. G. R. Livermore, Memphis, Tenn.—p. 500.
Diagnosis and Treatment of Conditions of Vesical Neck. E. G. Ballenger and O. F. Elder, Atlanta, Ga.—p. 506.
Ankylosis of Elbow. I. Cohn, New Orleans.—p. 511.
Treatment of Deformities Secondary to Burns. O. L. Miller, Charlotte, N. C.—p. 522.
Prophylaxis in Obstetrics. I. Procter, Raleigh, N. C.—p. 526.
Strangulated Hernia with Perforation of Afferent Loop. L. F. Watson, Chicago.—p. 531.
Local Anesthetics in Ophthalmic Surgery. E. Hill, Richmond, Va.—p. 532.
Treatment of Asthma by Removing Obstructions of Upper Respiratory Tract. E. L. Posey, Jackson, Miss.—p. 535.

Symptoms of Achylia Gastrica.—In analyzing the symptoms of 100 cases of achylia gastrica, Fontaine observed that while the symptoms of loss of weight and strength, pain and tenderness, cramping and discomfort in the abdomen, accompanied by low blood pressure, are frequently present, they alone are not diagnostic of achylia gastrica and could be caused by other extragastric and intragastric conditions. The reliability of these symptoms is also greatly lessened because in 21 per cent. of the cases of the series absolute achylias existed in the absence of any single symptom that could have been referred to the gastro-intestinal tract. Therefore, the diagnosis of achylia gastrica cannot be made from the history, from a study of the symptoms, or from a radiographic study, but it is absolutely dependent on an analysis of the gastric contents after a suitable test meal, and it will frequently be overlooked unless this analysis is made a routine part of every general examination. The presence of an utter achylia should always be confirmed by a fractional analysis according to the method of Rehfuss, and it should be followed up by subsequent analyses at regular intervals.

Tuberculosis in Infants.—According to Schloss most, if not all, infants succumbing to generalized tuberculosis have passed through a stage during which the disease was localized and latent; and if the disease had been recognized then, the chances for effective treatment would have been good.

Tetany Caused by Mother's Milk.—Conrad believes that in the case that he observed, the mother's milk was the cause of the tetany.

Multiple Myeloma.—Two cases of multiple myeloma are reported by Scott, both with characteristic roentgen-ray findings and with Bence-Jones proteinuria. One case terminated in death in nine months. The other patient is still living and symptomatically in better condition than at any time in the last four years. Both cases presented very low kidney function evidenced by uremia, high nitrogen retention in the blood and low phenolsulphonephthalein excretion, but without hypertension. One of the two cases with greatly impaired kidney function presented very small, though definitely demonstrable, areas of disease in the cranial bones and lumbar vertebrae. There was an average daily excretion of approximately 10 gm. of Bence-Jones protein. The color index was constantly 1 or 1 plus on several examinations, in contrast with the low index of secondary anemia usually present in these cases. In one of the cases spontaneous crystallization occurred in the urine on cooling after voiding. The blood also showed practically unchanged amounts of urea nitrogen and creatinin on ingestion of protein, ranging from 0.2 gm. to 2.8 gm. per kilogram in twenty-four hours.

Tennessee State Medical Association Journal, Nashville

17: 35-77 (June) 1924

*Ventral Tumors of Sacrum. H. W. Hundling, Memphis.—p. 35.
Surgical Pathology of Gallbladder and Ducts. W. A. Bryan, Nashville.—p. 45.
*Fractures of Skull: Thirty-Two Cases. M. B. Davis, Nashville.—p. 48.
Focal Infections in Pregnancy. J. F. Adams, Bradyville.—p. 53.
"Hippocratic Oath." E. H. Baird, Dyersburg.—p. 56.
Insulin in Diabetic Complications. W. T. DeSautelle, Knoxville.—p. 61.

Ventral Tumors of Sacrum.—Hundling gives a résumé of nineteen cases of ventral tumors of the sacrum (Middledorpf tumors). Five patients with ependymal cell gliomas were operated on. The average age was 46 years. One patient was perfectly well ten years after operation, and one was improved nineteen months after, but complained of disturbance of function of the bladder and bowels. One died of recurrence nine years after removal of the growth. An exploration was made in one case, the condition proved to be inoperable, and the patient died fourteen months later of intestinal obstruction. The fifth patient had a recurrence two years after operation, but without discomfort. Dermoids were removed in four instances. The average age of these patients was 30 years. Postoperative data were obtained in three cases. One patient was well one year after operation, and another eight years after. One had a recurrence five years after the removal of the tumor. There were three patients with foreign giant cell tumors. The average age of these patients was 40 years. One was apparently well fifteen months after removal of the growth. Almost complete recovery was reported by another ten years later. The third patient died following operation. Carcinoma was found in two instances. One patient, aged 40 years, had an adenocarcinoma, and was practically well two years after operation. The other, aged 49 years, had a colloid carcinoma and was markedly improved three years following its removal. Myomas were removed in two instances. One patient, aged 37, was improved three years after operation, and another, aged 56, died from recurrence one year after operation. One patient, aged 64 years, with a myosarcoma, died from recurrence one year after operation. One patient, aged 19, died from recurrence fifteen months after the removal of a sarcoma. The growth was composed of foreign body giant cells with mitoses. An inoperable basal cell epithelioma was found in one instance.

Fracture of Skull.—In the thirty-two cases observed by Davis, there were nine fractures of the base, with four deaths, a mortality of 44 per cent.; four cases of massive brain injury with four deaths, a mortality of 100 per cent.; five simple fractures of the vault with no deaths; ten compound and depressed fractures of the vault with two deaths, a mortality of 20 per cent., and four cases of gunshot wounds of the skull with two deaths, a mortality of 50 per cent.

Texas State Journal of Medicine, Fort Worth

20: 161-212 (July) 1924

Treatment of Puerperal Infection. C. J. Miller, New Orleans.—p. 168.
Surgical Treatment of Solitary Tumors of Peripheral Nerves. W. O. Ott, Fort Worth.—p. 171.
Difficulties of Tumor Diagnosis. K. M. Lynch, Dallas.—p. 175.
*Skin Manifestations of Leukemia and Allied Conditions. I. L. McGlasson and C. F. Lehmann, San Antonio.—p. 177.
Systemic Effects of Oral Infection. S. B. Riggs, San Antonio.—p. 182.
Treatment of Cancer of Lower Lip. O. L. Norsworthy, Houston.—p. 184.
*Nephrectomy: Two Cases. G. T. Hall, Big Spring.—p. 188.
Direct Laryngoscopy with Directoscope of Haslinger. S. Israel, Houston.—p. 190.
Intracranial Hemorrhage in Newly-Born: Case: Recovery. J. H. Park, Jr., Houston.—p. 192.
Roentgen-Ray Treatment of Deafness. H. L. Warwick, Fort Worth.—p. 194.
Sterility: Cause and Treatment. R. F. Metcalfe, Fort Sam Houston.—p. 199.

Skin Lesions in Leukemia.—A case of Hodgkin's disease, one of lymphosarcoma, and one of mycosis fungoides are reported by McGlasson and Lehmann, showing skin changes which may be classed as leukamides, and also a case of lymphatic leukemia which presented skin tumors characteristic of true lymphomas.

Nephrectomy for Suppurating Kidney.—In one of his two cases Hall did a preliminary nephrotomy and evacuated four quarts of pus. An operation for removal of the kidney shell was carried out under ether, seven days later. This operation was followed by a very smooth convalescence. The history of the case had been like that of intermittent hydronephrosis, but for years the urine had contained pus in large amounts. The second case was one of "acute kidney," a case of multiple septic infarcts of the kidney, characterized by the absence of practically all symptoms that would indict the kidney.

Virginia Medical Monthly, Richmond

51: 197-264 (July) 1924

Slit-Lamp Microscopy. H. H. McGuire, Winchester.—p. 197.
Status of Tuberculosis in Richmond for 1923. W. N. Mercer, Richmond.—p. 200.
Variants of Staphylococcus and Streptococcus Simulating Gonococcus in Chronic Urologic Infections. T. V. Williamson, Norfolk.—p. 203.
Inguinal Hernia. D. T. Tayloe, Jr., Washington, N. C.—p. 208.
Pyelitis of Pregnancy. S. B. Cary, Roanoke.—p. 212.
Malnutrition in Schoolchildren. C. E. Conrad, Harrisonburg.—p. 214.
Malnutrition and Marasmus in Infants. J. S. Weitzel, Richmond.—p. 216.
Backache. R. M. Hoover, Roanoke.—p. 221.
Case of Mastoiditis, Epidural Abscess with Apparently no Middle Ear Involvement. J. E. Diehl, Norfolk.—p. 223.
Adult Disabled. T. Wheeldon, Richmond.—p. 225.
*Pulmonary Tuberculosis Patient as Surgical Risk. O. O. Ashworth, Richmond.—p. 227.
Cancer of Cervix. C. Z. Corpening, Suffolk.—p. 230.
*Case of Complete Laryngeal Stenosis. J. R. Gorman, Lynchburg.—p. 232.
*Treatment of Vincent's Angina. T. L. Driscoll, Richmond.—p. 233.
Psoriasis: Case Report. G. T. Brown, Washington, D. C.—p. 234.
Electrocoagulation Methods in Treatment of Hemorrhoids. J. B. H. Waring, Blanchester, Ohio.—p. 235.
Determination of Kidney Function. S. H. Rosenthal, Lynchburg.—p. 238.
Bile Reaction in Urine. W. M. Bowman, Petersburg.—p. 240.
Endocrine Radiation to Improve Quality of Voice. H. H. Rubin, New York.—p. 241.

Tuberculous Patient as Surgical Risk.—Since rest and nutrition are the chief factors in treating tuberculosis, Ashworth feels that any operation, as for gallbladder disease, gastric ulcer, appendicitis, etc., which will relieve indigestion and promote assimilation of food with a minimum of danger from the operation, is a great aid in treatment of tuberculosis.

Complete Laryngeal Stenosis.—Gorman's patient had worn a tracheotomy tube for twelve years because of obstructed breathing due to extensive ulceration. Examination of the larynx by indirect method showed extensive ulcerations involving the whole epiglottis, larynx, and extending down into the trachea. The vocal cords, both true and false, were entirely destroyed by the ulcerative process. The general condition of the patient was very good. The Wassermann examination showed a four plus blood. The local ulcerative processes healed quickly under antisyphilitic treatment but in the process of healing, there developed across the upper part of the larynx a very thick membrane completely obstructing the larynx. This occurred in the form of a weblike process extending from the base of the epiglottis in front along the

line of the false cords to the base of the arytenoids behind. Under local anesthesia, as much of the membrane as possible was removed with the aid of the direct laryngoscope. The larynx was dilated with Jackson's triangular laryngeal dilators. Free breathing was restored.

Treatment of Vincent's Angina.—Driscoll asserts that 5 c.c. antimony and potassium tartrate, 1 per cent. solution, injected intravenously, is a specific in cases of Vincent's angina.

West Virginia Medical Journal, Huntington

19: 337-392 (July) 1924

Surgical Advancement in Last Twenty-Five Years. M. V. Godfrey, Charleston.—p. 337.
Diagnosis of Early Pulmonary Tuberculosis. W. E. Vest, Huntington.—p. 341.
Consultant Service for Tuberculosis Clinics. H. Brown, Pittsburgh.—p. 343.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

47: 109-259 (May) 1924

Fundamental Nervous Processes in Cortex of Cerebral Hemispheres. I. Principal Stages of Development of Individual Reflex: Generalization and Differentiation. J. S. Beritoff.—p. 109.
"Paratrigeminal" Paralysis of Oculopupillary Sympathetic. J. G. Raeder.—p. 149.
*Muscular Rigidity of Paralysis Agitans; Relationship to Tremor. F. M. R. Walshe.—p. 159.
*Plastic Tonus in Sequel of Epidemic Encephalitis. D. McAlpine.—p. 178.
*Familial Cerebral Degeneration Affecting Lenticular Nucleus. D. Paterson and E. A. Carmichael.—p. 207.

Muscular Rigidity of Paralysis Agitans.—Walshe's observations demonstrated that the rigidity of paralysis agitans is abolished by intramuscular injections of procain, of the same strength as suffices to render the spastic muscles of a hemiplegic subject flaccid; that this flaccidity is obtainable without any impairment of voluntary power, or of the indirect faradic excitability of the muscle; that the tremor is unaffected by this means; and that certain striking changes are to be seen in the voluntary activities of muscles treated in this way. From this it is argued that the rigidity of paralysis agitans demands for its development and maintenance the integrity of the proprioceptive reflex arc arising in the muscle itself, while the tremor, whatever its nature, is not so dependent and thus differs essentially from the rigidity.

Plastic Tonus and Muscular Rigidity in Encephalitis.—In McAlpine's case a condition of well marked plastic tonus existed in the limbs on the right side of the body, and this was associated with muscular rigidity, at times flexor in type and at other times extensor, which, under certain circumstances, closely approximated to that observed experimentally in animals in whom unilateral decerebration in the region of the midbrain had been performed. The left upper and lower limbs showed none of these phenomena, but were the seat of a rigidity typical of parkinsonism.

Familial Cerebral Degeneration.—Paterson and Carmichael describe a condition of cerebral degeneration ocurring in two children, which presents the following characteristics: (*a*) It is familial. (*b*) Clinically it gives rise to apathy and apparent blindness without changes in the fundi of the eyes. (*c*) There is an absence of paralysis and abnormal movements. (*d*) The children live from two to six months and occasionally up to 2 years of age. (*e*) It is probably due to an intra-uterine infection. (*f*) The severest pathologic changes are found in the lenticular nuclei, while the cortex is badly developed and degenerated.

British Medical Journal, London

1: 1079-1118 (June 21) 1924

Nutritional Disturbances of Infancy. B. Myers.—p. 1079.
Heart Before Harvey. J. E. Frazer.—p. 1083.
*Larva of Warble-Fly as Human Parasite. F. W. Style.—p. 1086.
*Etiology and Treatment of Rheumatoid Arthritis and Allied Diseases. S. G. Billington.—p. 1087.
*Treatment of Migraine. J. L. Greig.—p. 1089.
Opium Poisoning and Pontine Lesions. C. O. Hawthorne.—p. 1089.
Surgical Emphysema Due to Parturition. D'A. Harvey.—p. 1089.

Larva of Warble-Fly as Parasite.—A case of myiasis due to a warble-fly is reported by Style. The patient was 4 years of age. Attacks of severe pain and swellings about the head and neck were the chief symptoms. Curious features of the case were: (1) the regular intervals between the appearance of the swellings. There were five distinct attacks with about ten days between each. (2) Their symmetrical situation. The first swelling was in the left eye; the second in the left eye; the third in the right eye and cheek; the fourth in the left eye; the fifth in both eyes and cheeks. One maggot came from the right side of the scalp and two from the left side of the scalp. (3) The rapidity with which the edema subsided. The parasite is named *Hypoderma lineatum,* Vill., which is one of the two British cattle warble-flies, the other being *Hypoderma bovis,* De G.

Rheumatoid Arthritis.—According to Billington a very high percentage of rheumatic affections may, for practical purposes, be regarded as metastatic manifestations of focal bacterial absorption. In a small proportion of cases exciting causes, such as nervous shock, worry, trauma, etc., appear to play an important part. In another small proportion the disease supervenes on a febrile attack, though frequently in these cases a local septic focus has been lighted up. The three most important evidences of active arthritis are; pain apart from movement, the night pain being most characteristic; local tenderness and general debility with often a toxemic facial aspect. Treatment consists in removal of the focus of origin, autogenous vaccine therapy, heat, diathermy and electrotherapy.

Treatment of Migraine.—Greig believes in the gastric theory of migraine, that the condition is due to recurrent attacks of dilatation of the stomach and by means of regulation of the diet endeavors to maintain the stomach in its normal physiologic condition. The results are said to have been most satisfactory. Dilute hydrochloric acid is administered only during the first two weeks of treatment.

China Medical Journal, Shanghai

38: 341-436 (May) 1924

Radium: Physical and Therapeutic Properties. C. N. Frazier.—p. 341.
*Osteomalacia in China. F. J. Wampler.—p. 349.
*Blood Serum Globulin in Schistosomiasis Japonica. H. E. Meleney and H. Wu.—p. 357.
Chinese Drugs. I. Tang-Kuei. C. F. Schmidt, B. E. Read and K. K. Chen.—p. 362.
*Schistosomiasis Japonica. W. E. Libby.—p. 376.
Growth of Chinese. S. M. Shirokogoroff and V. B. Appleton.—p. 400.
Hookworm Control in Hainan. N. Bercovitz.—p. 413.

Osteomalacia in China.—Among some of the outstanding features of a survey reported on by Wampler were that more than 75 per cent. of patients with osteomalacia had tetany; 28 per cent. had a positive Chvostec sign; in 31 per cent. the disease began during pregnancy, and in 30 per cent. during the nursing period; one third of the patients reported edema over the affected parts; 80 per cent. were worse in winter and spring; in 39 per cent. the teeth were painful and loose. Out of a total of 130 children born to osteomalacic mothers, only fifty-four are living. There was also a familial tendency. The survey showed that osteomalacia resembles rickets in that it attacks people living in poor hygienic surroundings lacking sunshine, and who take insufficient exercise. The best results in treatment have been with cod liver oil and calcium. The doses given are one-half ounce cod liver oil, with 10 grains calcium lactate, morning and evening, or 15 grains calcium phosphate morning and evening. On this treatment the tetany disappears in a few days; the pains are relieved generally after ten days.

Blood Serum Globulin in Schistosomiasis.—The globulin precipitation test was performed by Meleney and Wu in fifteen cases of schistosomiasis japonica, and it was positive in thirteen. In fourteen cases in which the percentage of blood serum globulin was estimated, the average was 5.34 per cent. with a maximum of 8.54 per cent. and a minimum of 2.82 per cent. The authors recommend this test as a confirmatory diagnostic procedure in schistosomiasis, and suggest that in cases under treatment the disappearance of the reaction may prove to be a valuable indication of the success of the treatment.

Tartar Emetic in Schistosomiasis.—Libby states that tartar emetic, in doses of from 4 to 10 grains, will effect practically a cure in the mild cases and improve the moderately severe. But in the severe cases, where there has been marked injury to the liver and spleen particularly, it will not stay the progress of the disease. If the drug is at all effective it will be noted by the time 12 grains have been given. If there is no beneficial effect with this amount, continued treatment is of little avail. From his experience tartar emetic is more toxic than has been believed.

Indian Medical Record, Calcutta

43: 129-160 (May) 1924

Intestinal Paralysis Cured by Galvanic Current. J. N. Sarkhel.—p. 129.
Passive Anaphylaxis. A. T. Roy.—p. 131.
Estimation of Calcium in Blood. N. K. Sen.—p. 138.
*New Test for Bile in Urine. P. Ganguli.—p. 138.
Female Sex Glands: Ovary. S. K. Mukherji.—p. 138.

Test for Bile in Urine.—Ganguli adds a few drops of a 3 per cent. solution of paradimethylaminobenzaldehyd in 50 per cent. hydrochloric acid to 5 c.c. of urine and heats the mixture to boiling. Carefully heating the test tube above the level of the fluid, a green colored film will appear on the inner surface of the test tube. This test is said to be extremely delicate and 1/100,000 part of bile in the urine can be detected.

Journal of Tropical Medicine and Hygiene, London

27: 121-174 (June 2) 1924

Dr. Sambon's Cancer Inquiries. W. Simpson.—p. 123.
Elucidation of Cancer. L. W. Sambon.—p. 124.

Lancet, London

1: 1297-1346 (June 28) 1924

Chaulmoogrates and Morrhuates in Treatment of Tuberculosis. L. Rogers.—p. 1297.
*Antibacterial Power of Egg-White. A. Fleming and V. D. Allison.—p. 1303.
*Facial Phenomenon in Older Children. S. G. Graham and G. H. Anderson.—p. 1307.
Gullstrand's Slit-Lamp. L. H. Savin.—p. 1309.
Diagnosis and Treatment of Diabetes Mellitus. E. G. B. Calvert.—p. 1310.

Antibacterial Power of Egg-White.—Fleming and Allison have shown that egg-white contains a bacteriolytic, bactericidal and bacterio-inhibitory substance which they have named lysozyme. On a susceptible bacterium the lytic power is still manifest when the egg-white is diluted 50,000,000 times. The bacteriolytic power of egg-white from different species of birds varies considerably when tested to the same microbe. The egg-yolk has a very slight antibacterial action on a susceptible organism, but when tested to a less susceptible microbe it has apparently no antibacterial power, and to some extent inhibits the bactericidal action of the egg-white. Egg-white inhibits the growth of most of the pathogenic bacteria tested, and has a definite lethal or lytic effect on many of these bacteria—e. g., staphylococcus, streptococcus, meningococcus, *Bacillus typhosus, B. anthracis,* etc. The lysozyme of egg-white resists peptic and tryptic digestion, and following the ingestion of raw egg-white by the mouth the number of streptococci in the feces was temporarily much reduced. Egg-white added to blood in vitro maintains its antibacterial action, and when injected intravenously into an animal it confers on the blood serum of the animal marked antibacterial powers which are still evident after several hours.

Facial Phenomenon in Children.—In 1,723 children between the ages of 5 and 18 years, tested by Graham and Anderson, 29 per cent. showed a positive facial phenomenon. A positive facial phenomenon in older children is not to be considered as evidence of latent tetany, because (*a*) there is no increased electrical excitability; (*b*) no other sign of tetany and no history of previous tetany could be obtained in any of the cases; (*c*) the sign varies from day to day; (*d*) the calcium and phosphorus content of the serum were not found to be altered; (*e*) the sign was found most frequently in the class of children in whom tetany rarely occurs; (*f*) treatment with calcium chlorid failed to produce a complete disappearance of the sign, as it does in cases of undoubted tetany. The fact that the sign occurred as frequently among healthy children as among ailing children, and its common occurrence in the children brought up under the best social conditions, have led the authors to attach little significance to its presence except as a possible indication of a neurotic disposition.

Medical Journal of Australia, Syndey

1: 503-526 (May 24) 1924

Ether and Ethyl Chlorid. A. P. Murphy.—p. 503.
Chloroform and Regional Anesthesia. C. A. Thelander.—p. 505.
Intratracheal Method of Ether Anesthesia. R. E. Weaver.—p. 506.
Auditory Hallucinations. De W. Henty.—p. 508.
Infantile Paralysis of Cerebral Origin. A. W. Campbell.—p. 512.
Rupture of Spleen. E. Chenoweth.—p. 515.

SUPPLEMENT

Trachoma. D. D. Paton.—p. 338.
Prevention of Myopia. J. W. Barrett.—p. 343.
Acquired Axial Myopia. F. A. Newman.—p. 345.
Clinical Dangers from Wassermann Reaction and Use of Salvarsan. J. L. Gibson.—p. 348.
Sympathetic Ophthalmia. J. L. Gibson.—p. 350.
Arteriosclerosis: Ophthalmic Signs and Symptoms. J. C. Douglas.—p. 352.
Renal Disease and Arteriosclerosis. L. J. C. Mitchell.—p. 354.
Accidents at Sea Due to Visual Defects. J. W. Barrett.—p. 357.
Vision at Sea. D. D. Paton.—p. 358.
Causes of Blindness. J. W. Barrett.—p. 359.

1: 527-554 (May 31) 1924

Pulmonary Tuberculosis: Sanatoroum Treatment. J. G. Hislop.—p. 527.
*Early Postmortem Changes in Pancreas. G. Cameron.—p. 532.
Onyx. H. Armstrong.—p. 539.
*Ruptured Ovarian Cyst. H. F. Perkins.—p. 540.
*Unusual Dermoid. W. Trethowan.—p. 540.

SUPPLEMENT

Strabismus. E. T. Smith.—p. 361.
"Lamellar" Cataract. J. R. Anderson.—p. 363.
Sarcoma of Soft Palate; Angiopapilloma of Trachea; Tumor of Carotid Body. T. S. Kirkland.—p. 366.
Nasal Catarrh. R. Pulleine.—p. 370.
Remote Effects of Chronic Tonsillitis. C. M. Eadie.—p. 372.
Intracranial Suppuration of Otitic Origin. F. Andrew.—p. 377.
Sinusitis in Children. W. K. Hughes.—p. 380.
Radical Frontal Sinus Operation Through Orbito-Frontal Wall; After-Treatment by Open Method. R. S. Godsall.—p. 383.

Early Postmortem Changes in Pancreas.—This subject was investigated experimentally by Cameron. Postmortem changes affect the cells of the pancreas in the following order: (*a*) B cells; (*b*) A cells; (*c*) acinar cells. The most important changes occur within the first eight hours. Zymogen granules are much more resistant to postmortem change than the A and B granules. This is further evidence that the former differ from the latter in composition. The similarity of early postmortem in the islets to those occurring in experimental and human diabetes mellitus is apparent.

Ruptured Ovarian Cyst with Tubal Pregnancy.—Perkins reports the case of a woman, aged 27, who had been operated on for a right-sided tubal pregnancy eighteen months before he saw her. Two mornings before he saw her she had wakened with a great pain "all over her stomach." At operation the abdomen was found filled with blood and blood clots. The source of the bleeding proved to be a ruptured ovarian cyst on the right side. On the left side there was a tubal pregnancy and another large ovarian cyst. The tube was filled with blood and was on the point of rupture.

Retroperitoneal Dermoid Cyst.—The dermoid cyst in Trethowan's case appeared to spring from about the level of the third lumbar vertebra, it was retroperitoneal and had grown forward in the fold of the mesentery. The cyst was filled with sebaceous material and hair. To its wall was attached a sausage-shaped tumor about 15 cm. long and 7½ cm. in diameter, tapering somewhat to the ends. At the free end there was located an oval "mouth" about 5 cm. by 2½ cm. from which five teeth protruded. The roots were firmly fixed in bony sockets. The body of the tumor consisted chiefly of fat. Running through its length was a slender bone, flattened from side to side, strongly suggesting a rib. At the fixed end of the tumor this bone was enlarged into a flattened base which was embedded in the wall of the cyst. Toward the free end of the tumor the riblike bone enlarged into a rounded extremity. The bony walls of the two enlarged extremities were of egg-shell thickness and contained marrow without any cancellous bone. Other tissues seen in section comprised normal looking connective, fatty fibrous tissues, blood vessels and here and there what appeared to be nerves.

Bulletin de l'Académie Royale de Médecine, Brussels

4: 215-330 (April 26) 1924

*Test for "Irritable Heart." L. Dautrebande.—p. 215.
*Curettage of Tuberculous Abscess. H. Schwers.—p. 248.
*Metal Ions in Relation to Neoplasms. Slosse and Reding.—p. 268.
Study of Hemolysis. Herman.—p. 291.
Toxicologic Research on Calabar Bean. Schoofs.—p. 303.
Case of Cleidocranial Dysostosis. Delchef and Ory.—p. 316.

Test for "Irritable Heart."—Dautrebande describes a test based on the interval before return to the preceding figure of the alveolar carbon dioxid tension after a given physical exertion. With irritable heart, the output of the heart is much reduced, and the arterial blood shows gaseous alkalosis while the venous blood shows gaseous acidosis. The output of the heart at rest was found strictly proportional to the length of the interval before return to normal of the alveolar carbon dioxid tension after the test effort.

Operative Treatment of Chronic Tuberculous Abscesses.—Schwers' method was summarized in the Belgium Letter in THE JOURNAL, August 2, p. 372. He has treated nearly 500 abscesses in 150 cases, the patients between 6 months and 71 years old, and the results, he says, surpassed those obtained by any other method.

Action of Metallic Ions on Cancer.—See Belgium Letter, p. 371.

Bulletins de la Société Médicale des Hôpitaux, Paris

48: 893-939 (June 20) 1924

Insufficiency of Anatomically Intact Kidney. M. Renaud.—p. 893.
*Insulin in Infantilism. E. Apert.—p. 894.
Malignant Endocarditis in Pregnancy. Caussade and Rasle.—p. 895.
Portable Apparatus for Pneumothorax. Bréger.—p. 902.
*Carotid Aneurysm. M. Leconte and P. Oury.—p. 906.
Kidney Sequelae in Weil's Disease. J. Troisier.—p. 910.
Serodiagnosis in Weil's Disease. Troisier and Rimé.—p. 912.
*Agglutination in Cerebrospinal Fluid in Weil's Disease. A. Pettit and E. Etchegoin.—p. 918.
Alternation of Asthma and Eczema. Pasteur Vallery-Radot and Haguenau.—p. 919.
Conditions for Success in Serotherapy for Tuberculosis. A. Jousset.—p. 923.

Insulin in Diabetes with Infantilism.—Apert presented a diabetic patient who at 17 years of age was stunted in his growth, 4 feet, 8 inches tall, and weighing only 63.8 pounds, with defective nutrition of the skin and genitals. After a year of almost uninterrupted insulin treatment the young man has gained more than a third of his weight, but only 3 cm. in height. The skin has now a healthy aspect and the genitals are developing normally. No other treatment was given. The infantilism was evidently due to the diabetic insufficiency of the pancreas.

Aneurysm Complicated with Tricuspid Insufficiency.—Leconte and Oury report a case of arteriovenous aneurysm of the left carotid artery and jugular vein complicated by tricuspid insufficiency, confirmed by roentgen ray. They say that, considering the gravity of the complication, removal of the aneurysm is necessary.

Agglutination of Spirochetes in Cerebrospinal Fluid.—Pettit and Etchegoin announce that in icterohemorrhagic spirochetosis the cerebrospinal fluid, like the blood serum, causes agglutination of the spirochetes.

Comptes Rendus de la Société de Biologie, Paris

91: 49-140 (June 20) 1924. Partial Index

*Bacterial Hemolysis. E. Wollman and I. A. Graves.—p. 50.
*Fecundation in Hens. E. Iwanow.—p. 54.
*Neurotropic Virulence of Rabies Virus. C. Levaditi et al.—p. 56.
*Rabies Virus in Oil. P. Remlinger.—p. 59.
*Bacterial Origin of Indican in Urine. A. Distaso.—p. 61.
*Absorption of Oil by Pleura. L. Binet and J. Verne.—p. 66.
*Jaundice of New-Born Mules. Moussu et al.—p. 68.
*Shock Protects Against Strychnin. Arloing and Langeron.—p. 73.
*Gage for Pressure in Capillaries. A. C. Guillaume.—p. 75.
Action of Roentgen Ray on Isolated Organ. J. Jolly.—p. 79.
Curative Action of Diphtheria Anatoxin on Experimental Diphtheria. C. Zoeller.—p. 81.
*Passage of Metals Through Placenta. H. Vignes.—p. 82.
*Inactivation of Sea-Urchin Spermatozoa. E. Godlewski.—p. 84.
*Rays Emitted by Animal Tissues. A. Gurwitsch.—p. 87.
Influence of Insulin on Respiration of Tissues. J. De Cloedt and J. Van Canneyt.—p. 92.
Influence of Cold Baths on Acid-Base Balance of the Blood. L. Dautrebande.—p. 94.
*Experimental Hyperglycemia. Stricker and Bouckaert.—p. 97.
Glucose-Insulin Equivalent. Bouckaert and Stricker.—p. 100.
Heat Given Off Under Influence of Insulin. J. P. Bouckaert and W. Stricker.—p. 102.
Influence of Strychnin on Reflex Arc. Bremer and Rylant.—p. 110.
Osmotic Pressure of Serum Proteins as Factor in Edema and Arterial Hypertension. P. Govaerts.—p. 116.
*Blood Sugar in Anaphylactic Shock. E. Zunz and J. La Barre.—p. 121.
Variations in Alkalinity of Blood in Anaphylactic Shock. Idem.—p. 126.
Atropin Protects Against Anaphylactic Shock. Idem.—p. 132.
*Tar-Induced Sterility in Mice. J. Maisin and P. De Smedt.—p. 134.
Nature of Primary Blood Cells. S. Gandolfo.—p. 139.

Bacterial Hemolysis and Proteolysis.—Wollman and Graves' experiments with the streptococcus and proteus proved that bacterial hemolysis is not accompanied by proteolysis.

Experiments on Fecundation in Fowls.—Iwanow injected a weak antiseptic solution to kill the spermatozoa in the whole genital tract of the hen. The hen was still laying fertilized eggs after three weeks' separation from the cock. The necropsy of hens killed at different intervals proved that motile spermatozoa were present in all parts of the tube five hours after the fecundation; that the number and motility of the spermatozoa were considerably diminished by the second day, and that they had disappeared entirely by the third day. His explanation is that an egg cannot be fertilized after it leaves the follicle, but that spermatozoa may penetrate through the membranes into the follicle, and impregnate not only the ripe egg, but even some of the unripe.

Fixed Rabies Virus.—Levaditi, Nicolau and Schoen's conclusion from their experiments is that rabies virus which has become adapted to the rabbit and changed into a fixed virus, does not lose its virulence for monkeys if injected intracerebrally. As the same result was obtained in a chimpanzee, the species closest to man, it may be assumed, they say, that the fixed virus has the same pathogenic neurotropic action on the human central nervous system. The Pasteur treatment thus utilizes a manifestly virulent virus. It has proved safe only by the desiccation undergone and by the subcutaneous mode of injection.

Olive Oil in Preservation of Rabies Virus.—Remlinger believes that olive oil cannot be used instead of glycerin in preservation of the brain and the spinal cord, as it does not protect the nervous substance against invasion by microbes during and after death. But it is different if the oil is mixed with some antiseptic, such as camphor, for instance.

Bacterial Origin of Indican in Urine.—Distaso's experiments on guinea-pigs proved the existence of indican in the urine when the colon bacillus was present in the feces and not without.

Absorption of Oil Through Pleura.—From ten to twenty days after an injection of rancid oil into the pleura of a dog, Binet and Verne found pseudomembranes on the surface of the lung and pronounced proliferation of connective tissue beneath the pleural epithelium. The oil did not seem to be absorbed. An injection of an oil which did not contain any fatty acid was followed by absorption of the oil. The absorption probably occurs through the epithelium of the pleura. It may be assumed that the oil absorbed by the pleura reappears in the lung and is there destroyed. This absorption is different from the absorption of fatty substances through intestinal villi, as fat corpuscles were never seen in the cells of the epithelium.

Jaundice in Young Mules.—Moussu, Giraudeau and Maubaret describe a disease of the mule which occurs in the first four or five days after birth, and is manifested by yellowish discoloration of the mucous membranes and blackish urine. The death rate is at least 50 per cent. The microscopic findings were similar to those in a grave anemia with pronounced destruction of corpuscles. The hemolysis is evidently consecutive to a change in the equilibrium of the blood fluid. Treatment consists in promoting coagulation. An intravenous injection of 50 c.c. of hemopoietic horse serum (from the third serial venesection) cures in 90 per cent. of the cases. A complete recovery occurs in two or three days, although the jaundice persists a little longer. This injection may be used as preventive therapy in the newly born mule, before appearance of any signs of the disease.

Anaphylactic Shock Protects Against Strychnin.—Arloing and Langeron report that an anaphylactic shock (second injection of serum or peptone) may occasionally protect a rabbit or guinea-pig against an otherwise lethal dose of strychnin.

Gage for Pressure in Capillaries.—Guillaume gages the capillary pressure with the spectroscope. His method is based on the disappearance of the oxyhemoglobin band as the capillary loops are emptied by compression of the skin.

Passage of Manganese Through Placenta.—Vignes injected intramuscularly into a gravid guinea-pig a solution of manganese. The amount of manganese found in the fetus was minimal compared with the quantity found in the organs of the mother and in the placenta. The findings in the fetus were similar to those following the administration of arsenic, lead and mercury, but noticeably less than when bromin is administered.

Inactivation of Sperm of Sea Urchin by Foreign Sperm.—The ova are not affected but the spermatozoa are agglutinated and rendered inactive by admixture with spermatozoa from foreign but closely allied species. The alkalinity of the medium is an important factor.

Rays Emitted by Animal Tissues.—Gurwitsch has confirmed the emission of rays by certain plant roots (garlic, onion), and that these rays induce karyokinesis in other roots. He now announces that similar rays are emitted by living tadpoles and by emulsions of their tissues.

Combustion in Experimental Hyperglycemia.—Stricker and Bouckaert studied with the help of a differential calorimeter the curves of the heat given off in animals subjected to continuous infusion of glucose or injection of epinephrin. An injection of epinephrin causes a hyperglycemia accompanied by increased metabolism, while infusion of glucose is followed by hyperglycemia and a decrease of metabolism. It seems that the glucose is not oxidized immediately in the blood; a hypodermic injection even in an animal fasting for several days does not increase the combustion. This may be explained, they say, by a specific action of the epinephrin or by the fact that the glucose had already passed through the glycogen phase.

Glycemia in Anaphylactic Shock.—Zunz and La Barre's experiments on guinea-pigs showed in the acute anaphylactic shock a phase of hyperglycemia accompanied by excessive proportions of the proteid sugar, and an increasing of lactic acid in the blood. This was followed by a phase of hypoglycemia with a notable increase of lactic acid in the blood.

Sterility Induced by Tar.—Maisin and De Smedt report observations on mice treated with coal-tar. Sterility occurred about the second month of the applications and persisted about two months after suspension. The course lasted four months. Fertility was probably regained, they say, in all the mice. This sterility may be due to a lack of germ cells, or to endocrine insufficiency of the genital or other organs, for instance, of the thyroid.

Journal de Médecine de Lyon

5: 351-380 (June 20) 1924

*Paralysis After Preventive Treatment of Tetanus. J. Lépine.—p. 351.
Disturbances of Speech. J. Froment.—p. 355.
*Prolonged Paralytic Syndrome in Alcohol Poisoning. R. Courjon.—p. 363.
*Hemorrhages in Epidemic Encephalitis. J. Dechaume and P. Sedaillan.—p. 365.

Brachial Paralysis After Preventive Treatment of Tetanus.—Referring to two cases, Lépine emphasizes that paralysis consecutive to this treatment affects the nerves of the upper extremities, especially the brachial plexus; mostly on the right side. In some cases the lower limbs were slightly affected. The clinical feature is a severe pain in the shoulder radiating along the arm, and in a few days incomplete paralysis, with loss of the tendon reflexes. Amyotrophia with partial degeneration is soon noted; fibrillary contractions were observed only in one case. The sphincters and the sight are intact. The lesion affects the nerve root; the nerve itself and the nerve centers are not touched. The disturbances seem to be more pronounced if associated with an anaphylactic reaction in subjects previously injected with the antiserum. But the nervous disturbance does not correspond to the intensity of the anaphylactic phenomena, and it may be assumed that it is caused by the tetanus toxin of the antiserum. The disturbances have persisted for a year or more in the experiences that have been published, even in cases with final recovery.

Paralytic Syndrome in Alcoholic Poisoning.—Courjon reports general paralysis in two cases of chronic alcohol poisoning—a paralytic syndrome rather than progressive general paralysis. He confirms the favorable course without any treatment.

Hemorrhages in Epidemic Encephalitis.—Dechaume and Sedaillan observed two cases of epidemic encephalitis combined with a hemorrhagic syndrome. One patient presented a purpura followed by scarlatiniform desquamation; in the other case the digestive tract was affected, with hematemesis and melena. In Sainton and Regnard's case with purpura necropsy showed a hemorrhagic focus in the right hemisphere. The hemorrhage may depend on the activity of the virus, or on changes in the hematopoietic organs, or lesions of the vessels.

Presse Médicale, Paris

32: 553-564 (July 2) 1924

Immunization Against Tuberculosis by Modified Tubercle Bacilli. Calmette, et al.—p. 553. See abstract, p. 477.
*Polyradiotherapy in Local Tuberculosis. J. Saidman.—p. 555.

Polyradiotherapy in Bone and Joint Tuberculosis.—Saidman reports the results of treatment of local tuberculous lesions in 200 cases by the ultraviolet rays alone or in combination with other forms of radiant energy. He emphasizes the significance of the skin reaction due to congestion of the capillaries and the simultaneous stimulating of endocrine organs through the sympathetic. He begins with a one minute exposure, the mercury quartz lamp at a distance of from 50 to 70 cm.; each following exposure is prolonged by one minute, and the distance is decreased to a minimum of from 20 to 30 cm. After appearance of the erythema, the dose is reduced by about a half and then again increased till reaching the skin dose. He gives two or three irradiations in a week. He claims to have had surprising success in the treatment of skin disturbances, cold abscess, adenitis, osteoarthritis, in some pleurisies, in peritonitis and especially with fistulous lesions. The roentgen ray produces a local, but a deep action; the ultraviolet rays affect favorably the general condition, and the infra-red relieve pain. The range was from 1,200 to 12,500 angstroms.

32: 565-576 (July 5) 1924

*The Hydremia Due to Insulin. F. Widal et al.—p. 565.
Treatment of Seasickness. Signoret.—p. 566.
Congenital Disturbances Due to Roentgen Ray. A. Schwaab.—p. 566.
Structure of Atoms and Their Chemical Affinity. A. Strohl.—p. 567.

Refractometric Examination During Insulin Treatment.—Widal, Abrami, Weill and Laudat point out the action of insulin on the water metabolism in diabetes. In eight cases of diabetes with acetonuria, during nineteen courses of insulin treatment, the refractometer never showed concentration of the blood, but dilution was evident in fifteen instances. The dilution occurred the first or second day of the treatment; the serum protein decreased the next day from 91 to 76.8 gm. and the dilution persisted and even increased after the treatment had been discontinued. A slight change in the water metabolism occurs in almost all cases but is not recognized clinically unless with the help of the refractometer. There is no parallelism between the blood dilution and retention of water, nor between the hydremia and glycemia, acidosis of the urine and assimilation of carbohydrates.

Policlinico, Rome

31: 293-352 (June 1) 1924. Medical Section

Auto-Agglutination in Blood of Woman of 27. V. Debenedetti.—p. 311.
Clinical Use of the Hematocrit. L. Pezzotti.—p. 319.
Blood Sedimentation Test. G. Scuderi.—p. 331.
Hemorrhagic Diatheses. C. Toscano.—p. 342.

31: 353-416 (July 1) 1924. Medical Section

*Early Intradermal Reaction in Echinococcosis. E. Trenti.—p. 353.
*Ambard's Coefficient in Infections. A. Brugi.—p. 366.
*Schick Test in Exanthems. R. Doria.—p. 372.
*Heredity of Blood Groups. P. Mino.—p. 380. Begun, p. 293.
*Blood Cholesterol in Children. G. Macciotta.—p. 406.

Early Intradermal Reaction in Echinococcosis.—Trenti found Casoni's intradermal reaction in human echinococcus disease superior to other biologic diagnostic methods.

Ambard's Coefficient in Infections.—In Brugi's experience, the ureosecretory coefficient was almost constantly higher in general infections. This sign of impaired renal function closely paralleled the fever, and disappeared in the convalescence of patients with normal kidneys.

Schick Test in Exanthems.—Doria made the Schick test in various exanthematous diseases. He found that its basis is entirely different from that of the tuberculin reaction which better parallels Schick's pseudoreaction.

Heredity of Blood Groups.—Mino publishes an extensive study on the heredity of blood groups. The few exceptions to the rule (thirteen families out of 409) do not prove much—partly because of possible technical errors, partly for obvious reasons.

Blood Cholesterol in Children.—Macciotta found a variable, but as a rule larger, proportion of cholesterol in the blood of nurslings. This is probably due to the food. In an attack of malaria and in acute bronchopulmonary processes the blood cholesterol diminishes. It is increased in febrile and destructive tuberculosis of the lungs in children.

Repertorio de Medicina y Cirugía, Bogota

15: 337-384, 1924

*Ovarian Cysts at Advanced Age. N. Buendia.—p. 340.
Exstrophy of the Bladder in Child with Dubious Sex. Idem.—p. 343.
Serologic Tests in Epidemic of Fever at Bucaramanga. D. D. MacCormick.—p. 347.
Comments on the Medical Faculty of the University of Bogota. Alan Gregg (New York).—p. 357.
*Mortality at Bogota. E. Enciso Ruiz.—p. 362.
Modern Tendencies in Medical Education. A. Gregg.—p. 365.
Alimentary Dyspepsia in Children. J. G. Escallón.—p. 372. Cont'd.

Ovarian Cysts at an Advanced Age.—Buendia states that torsion of an ovarian cyst compelled intervention in the woman of 85, and a second cyst was found on the other side. One contained 2 and the other 1.5 liters of fluid. The semi-seated position aided in the prompt recovery after their removal.

Measles Peaks at Bogota.—Enciso Ruiz relates that since early in the century measles has caused a large number of deaths every eighth year at Bogota. The next peak is due in 1930. Each eighth year the epidemic spreads rapidly in five months and then dies out from lack of further susceptible subjects or loss of virulence. The virus may persist for seven years in some intermediate host until it acquires virulence for man again.

Archiv für Gynäkologie, Berlin

122: 1-496 (July 1) 1924

Choice of Anesthetic in Gynecologic Operations. Peyser.—p. 1.
Obstetric Examination Through Rectum. R. Demme.—p. 19.
Young Human Ovum. P. Meyer.—p. 38.
Physiology and Pathology of Round Ligaments. M. G. Serdjukoff.—p. 88.
Embryology and Physiology of Clitoris Region. T. Temesváry.—p. 102.
Ovarian Artery with Ovarian Tumors. S. di Francesco.—p. 129.
True Peritoneal Pregnancy. W. Poten.—p. 134.
*Venous Pressure During Pregnancy and Parturition. Runge.—p. 142.
Does Weather Influence Occurrence of Eclampsia? Oppenheimer.—p. 158.
*Metastatic Puerperal Affections. A. Mayer.—p. 168.
Duplications of Female Genitals. R. Zimmermann.—p. 184.
*Behavior of Heart During Childbearing. S. Prassulides.—p. 200.
Exogenous Factors and Development of Fetus. Peller and Bass.—p. 208.
Morphologic Changes in Blood in Puerperal Affections in Relation to Bacteriologic Findings. Philipp and Fuss.—p. 239.
*Pregnancy and Suppuration in Adnexa. R. Kräuter.—p. 253.
Parenteral Protein Therapy in Adnexitis. H. Nevermann.—p. 273.
*Relations Between Ovaries and Renal Diabetes. H. Küstner.—p. 282.
Radiotherapy of Menstrual Derangement in Girls. F. Gal et al.—p. 310.
Reliability of Sachs-Georgi Reaction in Pregnancy. Tsakyroglu.—p. 333.
*Wassermann Test in Retroplacental Blood. Finkener and Neugarten.—p. 341.
Cystic Corpus Luteum and Cystic Follicles. H. Iseki.—p. 406.
Retrogressive Metamorphosis in Adenomyomas. W. Schiller.—p. 429.
Peritoneal Polycystic Lymphangioma. E. Puppel and G. B. Gruber.—p. 440.
Etiology of Hyperplasia of Uterine Mucosa. A. A. Babes.—p. 448.
*Findings in Soft Parts in Primiparas. E. von Graff.—p. 469.
Butter-Flour Mixture in Infant Feeding. P. Schumacher.—p. 479.
Multiple Hemangiomas with Cavities in New-Born Infant. Runge.—p. 491.

The Venous Pressure During Pregnancy, Delivery and Puerperium.—Runge determined on nongravid women that the venous pressure in arm and leg was equal. In the pregnant, on the other hand, the pressure in the veins of the legs is higher than in the ulnar vein, even from the first months of the pregnancy. The importance of this for development of varices is manifest. In the puerperium, the venous pressure in the legs drops far below the level of the pressure in the median vein. This predisposes to thrombosis.

Metastatic Puerperal Affections.—Mayer was impressed with the severity of the complications in the genital apparatus when infectious sore throat developed in a woman who had just been delivered. This was especially noticeable during the influenza epidemics. His experience teaches the medicolegal importance of the fact that fever developing during the puerperium is no proof that the fever is of genital origin. Even when genital infection develops during influenza, it may be merely the metastasis of the influenza and not true puerperal fever. Not only the courts but the laity should bear this in mind. There seems to be a special tendency for influenza to recur during confinement. A severe general infection can proceed from tonsillitis even when the local findings in the tonsils are not grave. The micro-organisms found in the genital organs need not necessarily be the same as those found in the primary disease. With mixed infection, one or the other may predominate.

The Behavior of the Heart During Pregnancy and the Puerperium.—In von Jaschke's service the condition of the heart is recorded in detail in all the women. The findings were pathologic in 2.8 per cent. of the 2,210 maternity cases in a recent four years, but the outcome showed that the prognosis is not inevitably grave with a heart defect, not even with failing compensation. If the myocardium is still vigorous, the defect compensated, and there is no complicating disease, the outlook is not unfavorable. The danger comes with complications, recurring endocarditis, nephritis, extensive tuberculous processes, curvature of the spine, etc. Of all the heart defects, the mitral, especially mitral stenosis, is most inclined to become aggravated during childbearing.

Pregnancy with Suppurative Adnexitis.—Kräuter remarks that suppurating processes in the adnexa generally preclude pregnancy, but conception is possible. The diagnosis is difficult, but the pain generally gives the clue even early in the pregnancy. The mortality averages 40 per cent., owing to the difficulty of differentiation, the frequency of rupture from compression by the enlarging uterus, and the spread of the infection to the uterus. In contrast to the principle in gynecology of conservative treatment of pyosalpinx here operative measures are called for at once. If the uterus is not molested, the pregnancy is not interrupted.

Ovaries in Relation to Renal Diabetes.—Küstner's tabulated details from 150 parturients show that the renal diabetes which seems to be physiologic in pregnancy in women and animals disappears as term approaches. In only 20 per cent. did the renal diabetes persist into parturition. A tendency to glycosuria was evident also in nongravid women a few days before the menses and in animals during rut. In gravid animals, removal of the ovaries arrested the renal diabetes at once, but not removal of the uterus. Implanting ovaries from gravid animals in nongravid animals induced renal diabetes, persisting for several days. As this physiologic renal diabetes is observed from the very first of the pregnancy, it may serve in diagnosis of pregnancy. In three of his cases it was evident only a few days after the nonappearance of the expected menses. He has the patient drink freely before the test, and then injects 0.5 mg. of epinephrin fifteen or twenty minutes after ingestion of 10 gm. of glucose (in tea). The blood sugar in the 150 women never surpassed the physiologic limit of 0.2 per cent. and consequently it is not necessary to determine the blood sugar in applying the test for the diagnosis of early pregnancy.

Importance of Wassermann Test in Parturients.—This communication summarizes eleven years of systematic application of the Wassermann test in all maternity cases. It has revealed unsuspected syphilis in a number of cases and thus proved a guide for management and treatment of the new-

born as well as of the mothers themselves. With positive reaction in the retroplacental blood, the test was repeated on the arm blood unless there were unmistakable signs of syphilis. The reaction is more dependable the shorter the interval between obtaining the blood and the serologic test. In their 327 positive cases there was nothing else to indicate syphilis in five sixths of the total. In 40 per cent. the patients were unaware of their infection, and it would have escaped detection without the test. The Wassermann test of the blood from the umbilical vein is no criterion as to the presence or absence of syphilis in the new-born child. A positive reaction in the mother absolutely forbids giving the child to a healthy wetnurse, but the children of positive mothers can be interchanged, which often proves a great convenience in stimulating the breast to better secretion.

The Soft Parts Findings in Primiparas.—Von Graff concludes from study of 226 primiparas that in about 20 per cent. we can count on the external os keeping its size unmodified until actual labor pains begin and the cervix otherwise is fully dilated. The os, however, is usually dilated enough to admit a finger fully four weeks before the birth, even in primiparas. The cervical canal in about 66 per cent. of the women was shorter from the twenty-eighth to the thirty-sixth week and thereafter, and in the last month, even in the primiparas, was decidedly shorter.

Deutsche medizinische Wochenschrift, Berlin

50: 899-938 (July 4) 1924

Treatment of Cataract. W. Uhthoff.—p. 899. Cont'd.
*Hormone Treatment of Rickets. H. Vollmer.—p. 901.
*Disappearance of Chlorosis. T. Deneke.—p. 902.
*Hemoclastic Crisis and Vegetative System. W. Simon.—p. 903.
*Culture Medium for Typhoid Group. Hartoch and Schlossberger.—p. 904.
*Differentiation of Typhoid Group. W. Joffe.—p. 905.
*Heterotopic Epithelium in Ovaries. E. Stübler.—p. 908.
*Hereditary Cancer Types. J. H. Kaiser.—p. 909.
*Results of Amputations. Böhm.—p. 911.
*Painful Points on the Thorax. Tellgmann.—p. 914.
*Syphilis of the Nervous System. J. H. Schultz.—p. 914.
Technic of Blood Transfusion. Lichterfeld.—p. 914.
*Treatment of Angiomas. E. Moser.—p. 915.
Caps for Pipets. F. v. Kováts.—p. 916.
Mineral Metabolism and Treatment. E. Starkenstein.—p. 917.
Law on Welfare of Adolescents. W. Lustig.—p. 919.
*Death Rate After Seventy. E. Roesle.—p. 921.
Teaching Hygiene by Radio. P. Frank.—p. 922.
Hygiene Education in Russia. N. Semaschko.—p. 923.

Hormone Treatment of Rickets.—Vollmer studied the influence of various hormones on the excretion of acids. The results of his investigations encouraged him, with György, to treat rickets with from 6 to 12 injections of extracts from the pituitary, thymus and ovary, alternately, every other day. The patients recovered in two or three weeks.

Disappearance of Chlorosis.—Deneke attributes the disappearance of chlorosis to the discarding of corsets by the present young generation. The corset injured the liver and spleen—both important organs of iron metabolism.

Hemoclastic Crisis and Vegetative System.—Simon observed an alimentary leukopenia in almost every one of his twenty-nine cancer patients. The reaction was absent in cured cases. Slight roentgen irradiation of the pituitary and infundibulum region inverted the reaction into leukocytosis.

Culture Medium for Typhoid Group.—Hartoch and Schlossberger describe a milk-agar medium which allows growth of paratyphoid B and the enteritidis group, but none of typhoid or paratyphoid A.

Differentiation of Typhoid Group.—Joffe recommends a peptone agar with salts from milk as a medium for culture of the paratyphoid A bacillus. Together with Hartoch-Schlossberger's medium and a normal bouillon agar, it makes the differential diagnosis in the typhoid group easy.

Heterotopic Epithelium in Ovaries.—Contrary to Sampson, Stübler attributes the heterotopic epithelial formations in the ovary to the peritoneum or surface of the ovary.

Hereditary Cancer Types.—Kaiser reports on a "cancer family." Seven out of nine members of one generation died from cancer. There was a noticeable predilection for the stomach and gallbladder among the descendants.

Results of Amputations.—Böhm reviews the results in amputations. Lisfranc's and Chopart's methods are a failure unless there is enough skin to cover the stump easily. In all amputations every centimeter of bone is worth saving. Sauerbruch's prothesis is good for quick grasping, although not for holding or carrying. Yet the number of persons using the method becomes smaller with every year. The muscle tunnels shrivel, get inflamed and smell badly.

Painful Points on the Thorax.—Contrary to Bing, Tellgmann could produce pain by pressure over the heart region and below the borders of the lung. He, therefore, attributes the pain to superficial fibers of the intercostal nerves and not to the pleura.

Syphilis of the Nervous System.—Schultz reports on four officers infected with syphilis by the same girl in 1908. One of them had a syphilis of the brain with hemiplegia, another tabes, and two died from a rapidly progressing general paralysis.

Treatment of Angiomas.—Moser had excellent results with Wyeth's injections of boiling water in hemangiomas.

Mortality After Seventy Years.—Roesle's statistics show an early and rapid increase in the mortality of old people during the war. The cities were more affected than the country.

Medizinische Klinik, Berlin

20: 881-918 (June 29) 1924

*Fibrous Mediastinopericarditis. H. Pollitzer.—p. 881.
Epithelial Growth in Ovary. E. Vogt.—p. 884.
Disturbances of Juvenile Bone Growth. Caan.—p. 886. Conc'n, p. 924.
Periodicity of Peptic Ulcer. A. Lechler.—p. 889.
*Acute Myelosis in Infant. J. Opitz.—p. 891.
Paravertebral Dulness. Windrath.—p. 893.
*Roentgen-Ray Treatment of Neuralgia. H. H. Matoni.—p. 894.
Treatment and Cause of Glaucoma. E. Weinberg.—p. 897.
Recovery After Wound of Heart and Lungs. E. Haim.—p. 899.
*Treatment of Leukorrhea. A. Landeker.—p. 900.
*Case of Copper Poisoning. J. v. Petheö.—p. 901.
Intravenous Injections of Thymol. G. Krutzsch.—p. 903.
Cancer and Its Treatment. Strauss.—p. 905. Conc'n, p. 942.

Paracardiac Adiastolic Stasis.—Pollitzer disregards the classic signs of chronic fibrous polyserositis, such as pulsus paradoxus, systolic retraction and diastolic protrusion of the chest wall. They are present also in other conditions, especially adhesion of the heart to the anterior wall. The main symptoms of the fully developed disease are universal edema with predilection for the lower eyelids and the muscles of the legs, which accounts for the frequently greater painfulness in comparison to edema of other origin. The violet cyanosis of the lower extremities in young persons is almost pathognomonic. There is slight icterus and a large but not pulsating liver. No positive venous pulsation is found and the examination of the heart region reveals, instead of the expected enlargement, a small, not palpably pulsating heart, with clear sounds resembling a pendulum rhythm but with preservation of the accentuation of the second sound. The chest is flat in front and drops off suddenly toward the axilla. The symptoms are caused by a fibrous fusion of the pericardium with surrounding tissues, which prevents a complete diastole. Although not theoretically indicated, the treatment may start with digitalis because it is difficult to tell how much the systolic force has suffered. The only help is Rehn's pericardiotomy (not a mere anterior cardiolysis). He believes that the affection starts in the centrum tendineum of the diaphragm, which is the cross-road of the thoracic and abdominal lymphatic system.

Acute Myelosis in Infants.—Opitz describes a case of acute myelogenous leukemia in a three months infant.

Roentgen-Ray Treatment of Neuralgia.—Matoni had good results with roentgen-ray treatment of trigeminal neuralgia and of sciatica.

Treatment of Leukorrhea.—Landeker treats leukorrhea with short applications of ethyl chlorid spray on the cervix and vagina. He repeats the treatment six to eight times at two day intervals.

Case of Copper Poisoning.—Petheö's patient, a boy 2½ years of age, died with symptoms of hemorrhagic gastroenteritis. He had been treated three days previously for eczema of the head by application of copper sulphate dissolved in cream, prescribed by a quack.

20: 919-956 (July 6) 1924

*Suboccipital Puncture. M. Nonne.—p. 919.
Nonspecific Protein Preparations. R. Schmidt.—p. 922.
Menstrual Hemorrhagic Hives. J. Weitgasser and K. Cafasso.—p. 926.
Urine Tests in Gonorrhea. F. W. Oelze.—p. 930.
Subacute Fever Conditions. O. Kurz.—p. 931.
Imitation of Paranoia. A. Kluge.—p. 935.
Affections of the Spleen. K. Mienzil.—p. 935.
Venesection with Potain's Apparatus. R. Unger.—p. 937.
*Surgery on Raised Limbs. R. Pichler.—p. 937.
Simultaneous Injection of Atropin and Pilocarpin. S. Baley.—p. 937.
Dold's Turbidity Reaction. F. Weyrauch.—p. 940.

Suboccipital Puncture.—Nonne observed one death from injury to a sclerotic abnormally situated cerebellar artery among his 310 suboccipital punctures. The subjective disturbances were much rarer and less pronounced than after lumbar punctures. It is valuable for diagnosis of blocked spinal canal and in treatment of meningitis.

Surgery on Elevated Extremities.—Pichler had good results with Bier's simplest method of local anemia. Elevation of the extremity is sufficient for small operations.

Münchener medizinische Wochenschrift, Munich

71: 887-930 (July 4) 1924

The Vegetative System in Pregnancy. L. Seitz.—p. 887.
*Blood Gases in Acetylene Anesthesia. R. Schoen.—p. 889.
*Treatment of Morphin Addicts. O. Wuth.—p. 893.
Ambulatory Pneumothorax Treatment. P. Mende.—894.
Nonspecific Protein Treatment. R. Schmidt.—p. 897.
*Lime Casts in Yellow Fever. W. H. Hoffmann.—p. 898.
*Biologic Diagnosis of Pregnancy. F. Binz.—899.
Mercuric Chlorid in Varicose Veins. C. Hempel.—p. 900.
Exanthem After Bismuth. Görl and Voigt.—p. 904.
Treatment of Spondylitis. F. Lange.—p. 904.
Diabetes Mellitus. F. Umber.—p. 905.
Deaths from Influenza and Tuberculosis. E. Maurer.—p. 907.

Blood Gases in Acetylene Anesthesia.—Schoen determined the concentration of acetylene, oxygen and carbon dioxid in blood during and after the anesthesia. The range of effective concentration of acetylene is broad—between 20 and 50 volume per cent. The oxidation processes are evidently reduced. Acidosis was observed from the beginning of the anesthesia.

Treatment of Morphin Addicts.—Wuth saw very little good effect from bromids and narcotics, including chloral, in treatment of morphin addicts. The antipyrin group is more advisable. Injection of cholin gave Klee and Grossmann promising results.

Lime Casts in Yellow Fever.—Hoffmann found lime casts in the gravely degenerated kidneys in twenty-four out of twenty-eight necropsies of persons who died from yellow fever. He found them also in experimentally infected dogs, but not in guinea-pigs. The changes resembled those after mercuric chlorid poisoning, and were so striking that they might serve for autopsy diagnosis.

Biologic Diagnosis of Pregnancy.—Binz observed a case of precocious puberty in a girl, aged 2, with an ovarian tumor. Injections of fluid from this tumor into mice caused a marked enlargement of the uterus. A parovarian cystoma gave similar results, while other tumors were without any effect. Serum from pregnant women caused a peculiar enlargement of the transverse diameter of the uteri of mice when injected in eight daily doses of 0.5 c.c. each.

Wiener klinische Wochenschrift, Vienna

37: 661-684 (July 3) 1924

*Preventive Hydrophobia Vaccination. R. Kraus.—p. 661.
*Secondary Dysentery Strains. B. Busson and N. Ogata.—p. 665.
*Regeneration of Spleen. Schönbauer and Sternberg.—p. 667.
Cyclic Changes of Erythrocyte Count. J. Sahler,—p. 669.
Electrocoagulation in Anal Fistula. W. Goldschmidt.—p. 672.
Roentgenography of the Appendix. A. Czepa.—p. 673.
The Kidneys After Bismuth Treatment. A. Fischer.—p. 674.
Paratyphoid Endocarditis. T. Dervis.—p. 675.
Injuries of the Ear. I. Hofer. Supplement, pp. 1-13.

Preventive Hydrophobia Vaccination.—Kraus attributes the ascending paralysis after preventive vaccination against hydrophobia to toxic substances in the brain used. The lowest incidence of paralysis is with Högyes' dilution method and with the milder Pasteur classical method. The occurrence of the paralysis varies in different institutes between 1:300 and 1:43,000. He suggests that institutes with a high rate of paralysis change their method and material.

Secondary Dysentery Strains.—Busson and Ogata confirm the frequent loss of agglutinability and changes of fermentative properties in dysentery strains which begin to grow after a few days in a bouillon culture cleared by the action of bacteriophages. These strains are resistant to bacteriophages and resemble in this respect, too, the group described by Schmitz. Such a strain was isolated by Busson from the stool of a nurse infected by a patient with perfectly typical Shiga bacilli.

Regeneration of the Whole Spleen.—Schönbauer and Sternberg extirpated the spleen in salamanders and other animals. The organ did not regenerate. Free autotransplants of parts of spleen in dogs grew to the omentum or mesentery but degenerated completely.

Zeitschrift für Geb. und Gynäkologie, Stuttgart

87: 475-685 (June 28) 1924

Maceration of Skin in Viable Child. W. Koerting.—p. 475.
*Tuberculosis and Pregnancy. F. Siegert.—p. 479.
Placenta Reflexa. A. Seitz.—p. 499.
*Anemia in Pregnancy. A. Alder.—p. 505.
*Behavior of the Leukocytes During Pregnancy. A. Heyn.—p. 518.
Acute Hydramnion. S. Goldschmidt.—p. 551.
Histologic Study of Ovarian Dermoids. F. Fischl.—p. 561.
*Idiosyncrasy to Scopolamin. H. Strube.—p. 572.
*Extragenital Waves in Biology of Women. Bokelmann and Rother.—p. 584.
*Basal Metabolism in Women. L. Kraul and G. Halter.—p. 606.
Pharmacologic Research on the Uterus. H. Schultheiss.—p. 614.
Spirochetes in the Vagina. Philipp.—p. 634.
Cause of Rupture of Follicle. P. Strassmann, Jr.—p. 640.

Tuberculosis and Pregnancy.—Siegert reports from Opitz' service the results of systematic interruption of the pregnancy by supravaginal amputation of the uterus and castration. The operation was done in the second to fourth month as a rule, never later than the fifth month, and only on women who already had at least two children and were apparently doomed otherwise. Of the 26 women thus treated more than a year ago, 20 were improved at once; the outcome is not known in 2 cases. The 4 women who showed no improvement all died in from one to eleven months; 12 in the improved group seem to have recovered entirely, and 8 have progressively improved except one who succumbed to a recurrence more than a year and a half later.

Anemia in Pregnancy.—Alder points out that in all the cases of anemia suggesting the pernicious type, in pregnant women, of which he can learn, there was a history of chlorosis or other affection liable to injure the blood producing organs.

The Leukocytes During the Gestation Period.—Heyn examined 44 healthy pregnant women before they had risen or eaten in the morning. The leukocytes ranged from 6,950 to 23,500 in the 23 primiparas and from 7,050 to 16,550 in the multiparas during the last two months of the pregnancy. In another group of 25 primiparas and 13 multiparas who had been out of bed for two hours doing light housework, the averages were 12,210 and 11,460. The eosinophils and lymphocytes scarcely reached the lowest range of normal figures, but the shifting to the left of the Arneth formula was pronounced in every month of the pregnancy. It can be relied on, he says, as a sign of probable pregnancy. When the shifting to the left is especially notable, the woman should be spared overexertion. He presents these physiologic hemograms to serve as a basis for diagnosis and prognosis in pathologic conditions.

Idiosyncrasy to Scopolamin.—Strube relates that Dioscorides described, three centuries before Christ, how the physicians of Alexandria gave their patients mandragora to reduce the pain from operations with hot iron or knife. The mandragora is closely allied to scopolamin, and the procedure was thus like the scopolamin-morphin of "twilight sleep." He reports two cases of severe toxic action from the latter in two women and grave manifestations of idiosyncrasy in a physician who had injected 0.0006 gm. of scopolamin by mistake for a sedative to relieve his asthma. On testing the blood of these three persons, Strube found extreme alkalinity. Instead of the normal 4 to 7 drops, 14, 11 and 17 drops of the reagent were required to neutralize 10 c.c. of blood. He warns therefore that before applying scopolamin-morphin a

test injection of 0.0002 gm. of scopolamin should be given. If oligopnea and xanthopsia develop in five minutes, no further scopolamin should be allowed.

Biologic Waves in Women.—The data presented confirm the cyclical variations in metabolism in women. There seems to be a physiologic relative acidosis preceding the menses. After the menopause, the biologic waves seem to settle to a regular level.

The Basal Metabolism in Relation to the Female Genital Functions.—Kraul and Halter noted an increase in the basal metabolism a day or two after roentgen-ray exposure, and the increase was known to persist for six weeks. Roentgen castration and removal of the uterus reduce the basal metabolism, but it is raised with myomas and metropathies.

Zentralblatt für Chirurgie, Leipzig

51:1335-1382 (June 21) 1924

*Fatigue Hypotonia and Gastric Ulcer. F. J. Kaiser.—p. 1336.
Gastric Myomas. N. Kleiber.—p. 1341.
Soft Parts in Finger Amputations. W. Porzelt.—p. 1343.
Morphology of the Clavicle in Man. F. Stoccada.—p. 1345.
Two Surgeons Operating Simultaneously on Same Patient. L. Kirchmayr.—p. 1346.

Fatigue Hypotonia and Fatigue Atony as the Cause of Gastric and Duodenal Ulcer.—Kaiser points out that recent theories in regard to the origin of gastric ulcer do not explain the first superficial defect in the gastric mucosa. Once the first defect is present, the further evolution is obvious. He holds that fatigue hypotonia is the most frequent but not the only cause of gastric ulcers. Stretching of the vessels from various causes (especially in persons in whom the blood supply is barely adequate), narrows the lumen and reduces to a dangerous level the blood supply to the gastric mucosa. The necrotic mucosa is attacked by the gastric juices, whence we have the beginning of an ulcer.

51: 1383-1446 (June 28) 1924

"Removal of Foreign Bodies from the Esophagus by Way of the Stomach." V. Hacker.—p. 1384.
Old Fractures of Neck of Femur. I. Heine.—p. 1390.
Roentgen Irradiation in Inflammation. F. Schück.—p. 1397.
Hernia on the Semilunar Line. A. Drescher.—p. 1400.
Plastic Herniotomy. V. Gussew.—p. 1402.
Construction of Cosmetic Umbilicus in Umbilical Hernia. L. Kirchmayr.—p. 1403.
Extreme Hyperglycemia Early in Experimental Necrosis of the Pancreas. Calzavara.—p. 1405.
*Postoperative Retention of Urine. Boeminghaus.—p. 1406.

Postoperative Retention of Urine in Children.—Boeminghaus reports a case in a boy, aged 7, following an operation on the scrotum. The ischuria lasted four days. He hesitated to use remedies employed in adults, such as intravenous injection of hexamethylenamin or catheterization, and recalled that children often urinate involuntarily during anesthesia. He accordingly anesthetized with ethyl chlorid, with the result that the bladder was relieved. The flow of urine ceased, however, before the bladder was emptied, and only by compression was the bladder completely evacuated. The same procedure had to be repeated the next two days, after which the boy could urinate voluntarily.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

1: 2825-2964 (June 21) 1924

*Cod Liver Oil in Local Treatment of Tuberculous Abscess. Huët.—p. 2826.
Influence of p_H on Action of Amylase. J. T. Groll.—p. 2832.
*Corrosion of Esophagus and Hematemesis. A. de Groodt.—p. 2838.
Development of Sinus Durae Matris in Man. C. van Gelderen.—2848.
*The Kidneys and Beta Oxidation. I. Snapper and A. Grünbaum.—p. 2856.
Fistula Between Stomach and Colon. M. J. F. van Oppen.—p. 2862.
*Varieties of Spirochaeta Pallida. A. Klarenbeek.—p. 2865.
Appeal for More Careful Statistics on Excess of Boy Births. Sanders.—p. 2913.

Cod Liver Oil in Local Treatment of Tuberculous Abscesses.—Huët injected directly into the "cold" abscess or the fistula cod liver oil containing 10 per cent. of iodoform. In the nine old abscess cases all were improved, and about 50 per cent. speedily healed. In the twenty-two fistula cases, three did not seem to be modified and three continued a progressive course, but all the others showed more or less improvement.

Bleeding from Corrosion in Esophagus.—De Groodt remarks that patches of corrosion in the esophagus have generally been attributed to changes after death, but in eighteen cases he has recently been studying they had evidently preceded death. There was a history of supposed gastric hemorrhages in most of these cases, but he is convinced that the corrosions were responsible for the bleeding. The stomach seemed to be intact, but the liver was always more or less pathologic. Cirrhosis and congestion of the liver derange the portal circulation and this in turn modifies the circulation in the esophagus vessels, with the terminal "hematemesis." It may be possible to ward off death from this cause by improving conditions in the local and portal circulation and thus arresting the hemorrhage. Von Eiselsberg has reported three and Pringle seven cases in which this proved possible and the patients were saved. The local hyperemia and the entrance of gastric juice, which is probably held stationary by spasm of the cardia, amply explain the corrosion and the resulting "hematemesis."

Elimination of Fat Acids by the Kidneys.—Snapper and Grünbaum present evidence to sustain their theory that the kidneys play an important part in beta oxidation, by which the fat acids are transformed in the course of their metabolism.

Varieties of Spirochaeta Pallida.—Klarenbeek declares that Levaditi and Marie's "neurotropic virus" resembles *Spirochaeta cuniculi* so closely that it is safer, at present, to regard them as identical, and a variety of *Spirochaeta pallida*.

1: 2965-3088 (June 28) 1924

Albuminuria and Functional Kidney Tests. J. W. Koning.—p. 2966.
Various Technics for Cesarean Section. Noë.—p. 2974.
Structure of Cell Protoplasm. H. C. Voorhoeve.—p. 2979.
Formation of Adipocire in Local Cemetery. Demmers.—p. 2984.
*Abnormal Cystin Metabolism in Children. G. O. E. Lignac.—p. 2987.
Hereditary Anomaly in the Cornea. Van Went and Wibaut.—p. 2996.
Present Status of Knowledge of Cystin Metabolism. Lignac.—p. 2998.
Carrel's Research on Tissues Growing Outside of Organism. M. A. van Herwerden.—p. 3004.
The Beccari Fermentation Chamber for Garbage. Van Loghem.—p. 3033.
Observation Department in the Care of Nervous and Mental Disease. W. Beyerman and J. L. van Lier.—p. 3037.

Cystin Deposits in Various Organs.—Necropsy of two boys, 2 and 3 years old, with severe rickets revealed cystin crystals scattered through the spleen, kidneys, intestines, choroid plexuses, liver and mesenteric glands. In both these cases, as also in Kaufmann's, in a male infant, the physical development from birth had been substandard, but the children were not mentally backward. All succumbed with the clinical picture of atrophy. Photomicrograms are reproduced.

Ugeskrift for Læger, Copenhagen

86: 511-526 (July 3) 1924

A Neurologist's Impressions of America. K. H. Krabbe.—p. 511.
Treatment of Duodenal Ulcer. Sir Berkeley Moynihan.—p. 513.
*Vital Statistics in Denmark. H. J. Hansen.—p. 521.

Vital Statistics in Denmark.—Hansen's charts show a decided downward trend of all causes of death since 1890 except from cancer. In 1890, deaths from cancer formed 6.6 per cent. of the total mortality, but in 1920-1922 they represented 12 per cent. The number of cases of delirium tremens treated in the hospitals averaged 4.3: 10,000 from 1890 to 1911 without much fluctuation, but since 1918, the number of cases has kept close to 0.1: 10,000.

86: 527-542 (July 10) 1924

*The Anoxemia in Pneumonia. C. Lundsgaard.—p. 527.

Oxygen Starvation in Pneumonia.—Lundsgaard presents evidence to demonstrate that the anoxemia of pneumonia patients surpasses that of persons with a heart defect reducing function by a third, and it also surpasses that of persons in the rarefied air of high altitudes. The oxygen content of the arterial blood as determined in fifty patients with croupous pneumonia and fourteen with influenza pneumonia, is compared with the oxygen content in a number of normal persons at an altitude of about 12,000 feet. The condition in both groups is very similar. Pneumonia patients thus have to combat the infection under conditions which reduce the resisting powers materially.